

BBC A3000 • ARCHIMEDES • BBC • MASTER

ACORN USER

SEPTEMBER 1991 £1.60

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EXPERIENCE



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DL'S 02 Jul 1991

**DESIGNER
LOGIC**
PUTTING DESIGN
INTO THE
CLASSROOM



**DIGGING
FOR DATA**
REVIEWING A NEW
APPROACH TO
ARC-HAEOLOGY



PERFORMING ARCS

ENTER THE MYSTERIOUS WORLD OF COMPUTERISED
JUGGLING USING YOUR BEEB OR ARC

TECHNO-I DIGITISER • BEEB CLASSICS • GAMESHOW

Still waiting?

Thousands of Aleph One ARM3 Upgrade users don't have to wait – almost every RISC OS application from Impression to Interdictor benefits from the increased speed of Acorn's ARM3 processor.

Once your dealer has fitted the Upgrade, you'll find your Archimedes runs more quickly and smoothly. Next time you're waiting for your ARM2 to catch up with you, why not investigate the Aleph One ARM3 Upgrade?

Available from all good dealers or direct from ourselves.

The Original *ideA*

"IDE is the small-computer drive standard for the future," said RISC User. "ST506 is on the way out; SCSI has only a limited future in the small drive market." Other manufacturers are now following our lead in IDE product development, but you know where the original *ideA* came from!

PERFORMANCE

IDE is the only true 16-bit hard disc system currently available for Archimedes computers. All data transfers are 16-bit all the way from the disc, through the interface, to the computer (except that the A3000 internal interface has an 8-bit link to the computer).

FLEXIBILITY

An *ideA* system can turn your A3000 into a 20, 40 or 60 Mb workstation with no external attachments, using hard discs which sleep quietly during periods of inactivity.

The *ideA* system caters for two low profile hard discs in the same internal or external housing, allowing you to build up your capacity in easy stages without wasting money.

Then there's the *ideA* 'hard card' option - a 2½-inch hard disc on a standard podule.

VALUE

We think *ideA* upgrades offer the best value for your money, and we aim to keep it that way. Advanced IDE disc technology means simpler, cheaper, more reliable interfaces. Manufacturers' prices for hard discs fall gradually, and we pass these savings on to you as soon as we can.

Our upgrade prices include controller cards and fans where needed. Our disc cases are of metal construction.

RELIABILITY

The first *ideA* customers have been using the system successfully since last year. The A3000 internal hard disc is particularly reliable - not one has had to be returned to us.

The latest IDE discs are ruggedly designed with lap-top and portable computers in mind. You'll wait a long time to see a defect! A skilled service team is ready to back up our guarantee should the need ever arise.

COMPATIBILITY

The Micro User reported "no difficulty in running all fully RISC OS applications". Our IDE filing system is no different from ADFS in use, though it has a few extra features such as the facility to write-protect a hard disc. DOS partitions can be created for the PC Emulator.

CONTINUED SUPPORT

The coming months will see the introduction of many new IDE products, including tape streamers and removable discs. You may rest assured that our software and hardware will keep pace with these developments. Updates for existing users, if they ever become necessary, will be simple and cheap.

Only Ian Copestake Software has the expertise gained over a year in designing and supporting IDE products. Trust to our experience.

A beautiful solution. (BBC Acorn User)



Do you have trouble remembering what twelve function keys do, with and without Shift and Ctrl, in twenty different applications?

Do you enjoy watching PipeDream insert a column when you thought you were saving an Impression document?

Up to now the best way to organise function key strips was with one of our Arkkeys.

From now on you may never look at a function key strip again.

QuicKey shows 36 function key combinations on your screen. All at the same time, using the minimum of screen space, even in mode 12. You can choose any of these (plus Ctrl A, Ctrl B etc) using only the mouse.

QuicKey knows which application is waiting for input and will show you the appropriate function key definitions - automatically!

No more mis-directed key presses, because you can see what you're going to do before you do it. QuicKey costs only £10 + VAT and comes with a range of popular definitions (including Edit), to which you can easily add your own.

You only have to lift your finger!

Some more original ideas!

(Please see our main list for prices)



TWO (Task and Window Organiser)

Do you wish you could start applications, display directories, and open files all in one go? With TWO you can.

Do you wish your pupils were able to start work without understanding the Desktop? With TWO they are.

Do you wish there was an easy way to tidy up your screen and find that buried window? With TWO there is.

TWO is far more than a 'sticky backdrop'. Its easy-to-use features make the Desktop a friendlier environment and will really save you time.

"As a recent purchaser of TWO may I say how delighted I am with it. Life with 'Archie' has suddenly become much simpler!"

"Just received TWO - marvellous for time saving."

"TWO is the best thing I've ever bought!"

DrawBender

DrawBender distorts Draw files to follow a shape of your choice. A useful addition or inexpensive alternative to other graphics software, supplied with these **three** decorative fonts.

DrawBender is simple and enjoyable to use, with no complex menu structures. Yet it produces results of a superior quality using an iterative reparameterisation algorithm. The example above uses DrawBender with FontFX - the two make ideal companions.

"An excellent tool. As though I've suddenly come across a new and unexplored area, very refreshing." "Quite stunning" (Archive)

AnDi Oddule

Baildon Electronics Oddules open the way to cheap, flexible and almost unlimited external expansion via the I²C bus already supported by RISC OS. Baildon are producing a range of Oddules which may be daisy-chained.

Ready now is the **AnDi** Oddule. It has eight digital I/O channels with high current open collector drivers, four A/D inputs, and one D/A output. AnDi is capable of emulating user and joystick ports, allowing ADVAL operation from BASIC, and the use of Concept Keyboards and analogue or digital joysticks.

Cross-32 Meta-Assembler

This professional table-based cross-assembler works with over 50 target processors (including ARM2 and 3), and has been used for some time on PCs. A RISC OS Desktop version by Baildon Electronics is now available. Cross-32 is user-friendly and supports conditional assembly and macros. Output is in absolute binary, or Intel or Motorola Hex formats (ideal for eeprom programmers and emulators).

You can modify the tables supplied or add new ones to cater for new processors and opcodes.

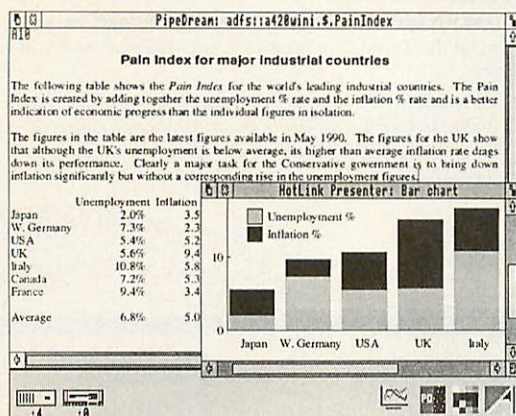
Ian Copestake Software

ACU21, 10 Frost drive, WIRRAL, Merseyside, England, L614XL

Fax 051-632 3434 Tel 051-632 1234

PIPEDREAM

WINNER
of the 1989/90
BBC Acorn User
Award for Best
32-bit Business
Software



The bar chart in the screen shown above was produced by using the HotLink between PipeDream 3 and HotLink Presenter.

Major features include:

- intuitive RISC OS user interface
- many documents loaded at once
- display and printing of pictures within text
- wysiwyg display including all RISC OS fonts
- built-in 93,003 word spelling checker
- file compatibility with PC & Z88 PipeDream & BBC View Professional
- natural, background recalculation
- keystroke compatibility with Z88 & PC PipeDream
- Z88 filing system
- automatic loading of VIEW, ViewSheet, Lotus, First Word Plus, Tab and CSV files
- automatic saving of VIEW, Lotus, Tab, CSV and Acorn DTP format files
- multi-field sorting
- 62 spreadsheet and database functions
- external references between documents for 3-D modelling
- macro file recorder
- slot protection

colton
software

PipeDream 3 breaks down the barriers between word processor, spreadsheet and database. With PipeDream 3, you can include numerical tables in your letters and reports, add paragraphs to your spreadsheets, and perform calculations within your databases.

PipeDream 3 has been written to take full advantage of RISC OS – if you can use RISC OS, you can use PipeDream 3. It is fully multi-tasking and multi-windowing, so you can work on many documents at once and instantly move information between them. PipeDream 3 can automatically load and save most popular file formats and is the first program to use the new RISC OS HotLink, which enables it to interact dynamically with Archimedes graphics programs, such as *HotLink Presenter* from Lingenuity and *GraphBox* from Minerva.

As well as winning the 1989/90 BBC Acorn User Award for Best 32-bit Business Software, PipeDream 3 was runner-up in the Best 32-bit Educational Software and Best 32-bit DTP/Word Processor categories.

PipeDream 3

Breaking down the barriers

POWER • SPEED • FLEXIBILITY • EASE OF USE

PipeDream 3 is for all Archimedes computers with 1Mbyte or more of RAM, including the A3000.

For a free brochure, see your Archimedes dealer, or phone us on 0223 311881, or return the coupon.

PipeDream 3 costs £147.00 + VAT.

For a free brochure, complete and return this coupon to the address below.

PipeDream 3 ☐

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Address

Post code

Colton Software,
2 Signet Court,
Swanns Road,
Cambridge,
CB5 8LA,
United Kingdom.
Tel. 0223 311881 Fax. 0223 312010
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ISSUE 110



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Editor Barry Monk
Technical Assistant Paul James
Art Editor Tony Judge
Editorial Assistant Sharon Halpern
Advertisement Manager
Duncan Pringle
Senior Sales Executive
Richard Power
Sales Executive Jack Manzoor
Ad Production Fiona Andrews
Production Manager Jennifer Jeffrey
Publisher Seamus Geoghegan
Publishing Director Michael Potter
Editorial Director Christopher Ward

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PRODUCED ON THE ARCHIMEDES

All the editorial pages in
BBC Acorn User are pro-
duced on a DTP system
using Acorn Archimedes
440/1 and A540 compu-
ters, Computer Concepts'
Impression 2 with Laser
Direct printers and Taxan
monitors

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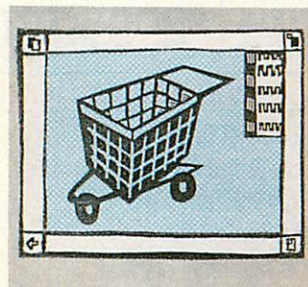
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**FREE
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ON-SITE
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with Archimedes
Micros

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Archimedes
Micros

ARCHIMEDES

A3000 Computer
£599

A3000 + Learning Curve
£699

SYSTEM	ENTRY	MONO	COLOUR	MULTISCAN
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420/1	£1299	£1359	£1478	£1648
440/1	£1699	£1759	£1878	£2048
540/1	£2995	£3065	£3178	—

FREE OFFERS ON ARCHIMEDES MICROS

COMPUTER	FREE OFFER
A3000	Upgraded to 2Mb RAM on Board + Monitor Stand + Dust Cover
A410/1	Upgraded to 2Mb RAM & a 20Mb Hard Disc, (A420) + Dust Cover
A420/1	Upgraded to 4Mb RAM & a 40Mb Hard Disc, (A440), Mk II Learning Curve + Acorn DTP Pack + Dust Cover
A440/1	High Resolution 14" Multiscan Colour Monitor + Dust Cover
or	Taxan 775 Monitor (Entry System) + Dust Cover
or	Star XB-2410 24 Pin Colour Printer (Colour System) + Dust Cover
A540/1	High Resolution 14" Multiscan Colour Monitor + Panasonic KX-P1180 Printer & Connecting Cable
or	Taxan 795 or 775 Monitor (Entry System) or Star XB24-10 24 Pin Colour Printer (Colour System)

A3000 ACCESSORIES

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A3000 Technical Manual	£28
Dust Cover Micro/Monitor	£5
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BBC MASTER

MASTER 128K with View, Viewsheets, ADFS BASIC Editor & Terminal and our Special FREE OFFER, A 5.25" Double Sided, 40/80 Track switchable 400K Disc Drive, 20 Floppy Discs and Monitor Stand.

£399

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Archimedes Modem Cable	£14

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A3 Archimedes Keyboard	£141

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DXY-1300	£841	DPX & GRX Include
DPX-2500	£2366	12 months on-site
DPX-3500	£3281	maintenance

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College Computers

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Epson LQ2550 Colour	£696	Star LC24-200	£184
Epson SQ850	£438	Star LC24-200 Colour	£221
Epson SQ2550	£634	Star LC24-15	£294
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Hew/Pack Quietjet*	£305	Star FR15*	£267
Hew/Pack Quietjet Plus*	£358	Star XB24-10 Colour*	£276
Hew/Pack Deskjet 500	£298	Star XB24-15*	£358
Hew/Pack Paintjet*	£588	All printers marked by an *	
Hew/Pack Paintjet XL*	£1084	include 12 months on-site	
Hew/Pack Rug/Writer*	£838	maintenance.	

DELIVERY Archimedes Micros only: Free Delivery Hardware: £7 + VAT per box Software: £7 + VAT per order	Lasers: £15 + VAT per printer Next Working Day Service - call for details. UK Offshore - call for details
---	---

CREDIT CARD MAIL ORDER HOTLINE

081-680 5686 **FAX: 081-760 9861**

College Computers

Prices are subject to change without notice. Please check suitability with the manufacturers before ordering. Goods are not offered on a trial basis. Orders are accepted subject to our standard conditions of sale – available on request. F&OE

Subject to availability despatch is normally effected within 2 days from receipt of cleared payment. Please allow 7 working days for cheque clearance. All orders will be fulfilled within 28 days unless otherwise notified.

**College Computers, 14 Emmabrook Court, Sea Road,
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QUANTITY	DESCRIPTION	PRICE

Please state disk size _____

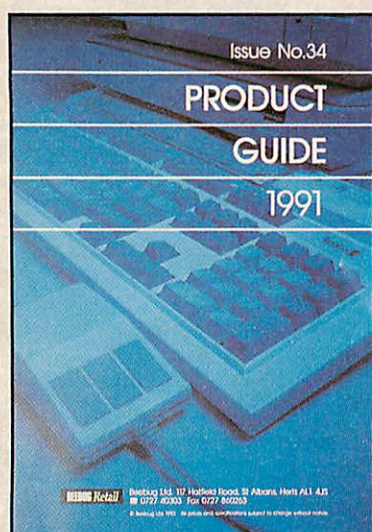
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The Product Guide



Beebug have published a 72 page full colour A4 product guide for users of BBC, Master, A3000 and Archimedes computers. It contains information on thousands of products that are available now for your computer. Whichever system you use, you will find this illustrated and helpful guide to be an invaluable source of information. Everything is covered from complete systems right down to spare parts. As an added feature comparison charts for monitors and printers are provided along with compatibility and upgrade information.

Special Offer on Archimedes Computers

To coincide with the launch of our new catalogue Beebug are making some very special offers on new Archimedes systems.

Archimedes A410/1 **Free 1 Mb RAM & 42 Mbyte Hard Drive**

The A410/1 is supplied with 1 Mb RAM. At no extra charge we will increase this to 2 Mb and install a 42 Mbyte high speed, top quality, branded IDE hard drive. Should you prefer an 89 Mbyte or 105 Mbyte instead, these are available for an additional £100 or £175 respectively.
Price £1099 With Colour Monitor £1319 (Acorn) or £1299 (CUB A3000)



Advanced Learning Curve **Free 2 Mb RAM & 89 Mbyte Hard Drive**

The A420/1 Learning Curve is normally supplied with 2 Mb RAM and a 20 Mbyte hard drive. We will increase the memory to the 4 Mb maximum and replace the 20 Mbyte drive with an 89 Mbyte high speed, top quality, branded IDE hard drive. Should you prefer 105 Mbyte instead of the 89 Mbyte, this is available for an additional £75.
Price £1299 With Colour Monitor £1519 (Acorn) or £1499 (CUB A3000)



These offers replace any previously published offers and are for a limited period only. All prices exclude VAT.

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LOW-COST SOUND SAMPLING ARRIVES

TWO low-cost digital sound sampling devices for the Archimedes have been released by both Hybrid Technology and Oak Solutions. At a glance it would be easy to confuse the two, not least because, at the time of going to press, both companies were using the same product name – Arc Recorder. It is understood that Hybrid and Oak are discussing how to resolve the confusion.

What the two samplers have in common is that they are both eight-bit devices designed to playback via the Arc's own sound circuitry. Both connect via the parallel printer port and are supplied with a microphone. They are also priced similarly – at around £30, both comprehensively undercut earlier sampler designs because they do not use the relatively expensive podule slot option. But that is where the similarities end.

The sampler from Hybrid Technology, the company known for the BBC Model B Music 5000 synthesiser, conforms to the firm's new access link bus protocol which will enable several forthcoming add-ons to be connected to the Archimedes' parallel port at the same time. There is a through connector enabling printers and dongles to be daisy-chained. An audio line-in socket is provided for direct sampling from a hi-fi source. Sampling can take place simultaneously with playback.

Emphasis has been placed on ease of use, contrasting with the complex software interfaces usually accompanying sound sampler devices. Hybrid's Chris Jordan wants to see his device used as a general-interest aid to computer users of all ages, not simply as a music sampler or technical sound analyser. A prime target is the classroom.

Samples are displayed graphically on-screen and selected samples can also be used to replace the Arc's standard audio waveforms.

Oak Solutions' device consists of a hand-held omnidirectional microphone which simply plugs into the printer port. The software for Oak's device was written by Paul Fellows, author of *Genesis*. Naturally, Oak sees its sampler as being an ideal extension of versions one and two of this package. The software supplied allows samples to be recorded, played back and transferred to *Genesis II* and other Archimedes applications via the standard *Armada* file format.

Both the Hybrid and Oak products are set to create increased enthusiasm for sound sampling on the Arc – it will be interesting to see how the confusion over product names is resolved.

ACORN IN TOP FIVE

ACORN Computers had the fifth largest share of the personal computer market in the UK in 1990, ahead of both Atari and Apple.

According to figures calculated in unit sales by computer industry research company, IDC*, Acorn's market share was just over six percent. Acorn's main competitor in the education market – Research Machines Ltd (Nimbus products) – was in eighth place with 2.8 per cent.

Atari was placed sixth with 5.5 percent of the market and Apple was next in seventh place with 4.3 percent.

The Apple Macintosh has never proved to be a major volume seller because of its relatively high price, but it will be interesting to see whether Apple's recent introduction of lower-cost models will boost its market share next year.

Acorn's marketing director, Mike O'Riordan, said he was pleased to see confirmation of the continuing sales growth in the Archimedes. By all accounts, Acorn sales – especially of the BBC A3000 – are holding up well despite the economic recession, which is having more effect on the near-saturated PC market.

Ahead of Acorn in the Top Five were, in order: Amstrad, IBM, Commodore and Compaq. That is impressive company for Acorn.

**IDC's estimates are based mainly on data from the manufacturers themselves.*

CALL FOR SOFTWARE

IF YOU are a software publisher, do you know that Acorn keeps a database of available software for the BBC and Archimedes machines?

If you would like your software to be considered for inclusion on the database, please contact Sue Wall at Acorn Computers on (0223) 245200 to obtain further information.

JOIN THE 'ELITISTS' AT BAU SHOW

THE Archimedes version of *Elite*, the hugely successful BBC micro game which has gathered thousands of fans since the original version was launched in 1984, will be launched at the BBC Acorn User Show at Wembley in October, writes *Mat Tizard*.

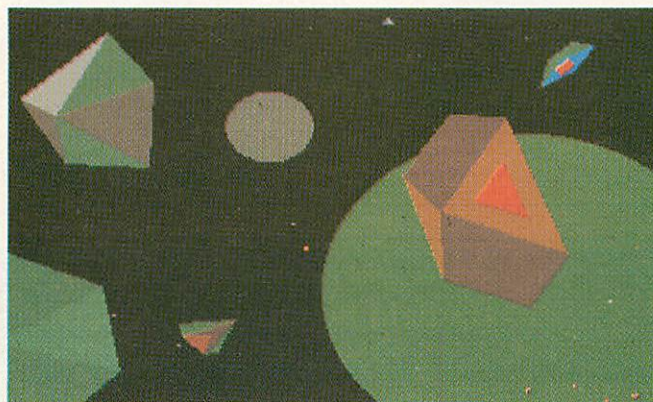
The game has been completely revised and redesigned by the new developers and incorporates all of the features of the original, plus a host of improvements.

The preview version clearly shows that existing *Elite* enthusiasts who have since upgraded to the Arc and are yearning for their favourite game to appear will certainly not be disappointed. Needless to say, with a new order of processing power the game now uses extremely fast solid 3D graphics routines which

can cope with a veritable armada of ships on screen at any one time without slowing down or compromising the atmosphere of the game.

The trading component has been made easier to use and financially more realistic, and the missions you are assigned as you progress are now far

more involved. Not only are the other craft you encounter endowed with intelligence, emotions and politics of their own, but they can also act on impulse – and, unlike the original, they are not above attacking each other as well as you. We could be in for a new generation of 'Elitists'.



IDE Hard Disc Upgrades for the Archimedes & A3000

**A revolution in
hard disc
expansion**

What is IDE?

IDE (Integrated Drive Electronics) is the latest interface standard for connecting hard disc drives to personal computers. Unlike previous interfaces it incorporates much of the circuitry on to the drive itself, greatly simplifying the interface electronics.

How fast is IDE?

The IDE interface uses a full sixteen bit data bus that allows very high transfer rates between the drive and computer. This coupled with cache memory on the drive itself provides for an Archimedes hard disc system that is typically 50% faster than the standard Acorn ST506 hard disc interface.

What drive options are available?

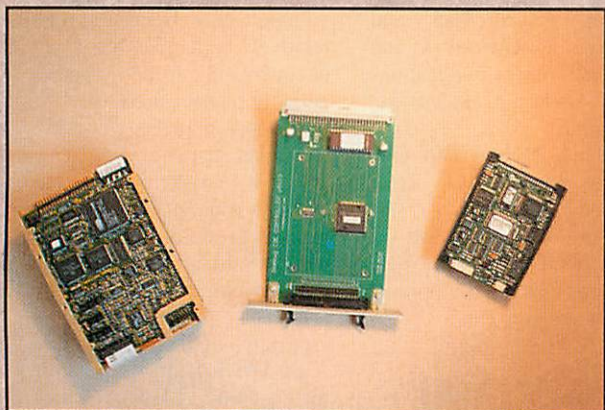
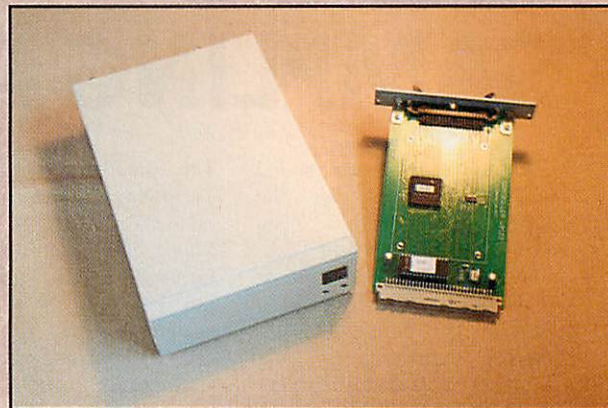
Archimedes 310, 440, 400/1 and 540.

Drive sizes currently available are 42, 89 and 105 Mbyte with a typical access time of 28ms for the 42Mb models and less than 20ms for the others.

These 3.5" drives are available as either internal or external units, and use our high speed 16 bit IDE interface card that fits in your podule backplane. External drives are attractively boxed with their own internal power supply and fan. You may even use both an internal and external drive from the same interface if required.

A3000

The external drives above are also suitable for the A3000, used in conjunction with the 16 bit interface card that fits in the A3000 podule slot. We are also able to offer internal IDE drives for the A3000 that fit into the internal podule slot. These special 2.5" drives are available in 20 and 42 Mbyte formats and have access times of 23ms.



Will my existing software work with IDE?

The careful design of RISC OS and IDEFS, our IDE filing system, ensures that all RISC OS compliant software will function perfectly with IDE drives. Some older software may need minor changes, but these are documented in the user guide. There are no hidden catches!

Can I add additional drives at a later date?

The IDE interface can support two hard disc drives. Typically, one of these would be fitted internally, and the second unit connected externally via the expansion connector provided on each interface card.

What does the future hold?

IDE is a relatively new interface standard, but has already gained massive support. The next few months will see drives up to 400Mbyte, with larger capacities, and devices such as tape-streamers following very soon. The future for IDE is very bright indeed.

Quality

You may have total confidence in our products. Only the best drives from recognised manufacturers are used, Conner, Seagate, NEC etc. All drive kits are supplied with full fitting instructions and a user guide to ensure that you will have no problems at all. Our interface conforms fully with Acorn's IDEFS specification.

Description	Internal		External		
	Stock Code	Price	Stock Code	Price	
Archimedes 42 Mb	5251	£269.00	5261	£359.00	All prices include IDE High Speed Interface. All prices are Ex VAT
Archimedes 89 Mb	5252	£389.00	5262	£479.00	
Archimedes 105 Mb	5253	£499.00	5263	£589.00	
A3000 20 Mb	5270	£375.00	N/A	-----	Available from your local dealer, or directly from Beebug (please add \$9 carriage).
A3000 42 Mb	5271	£569.00	5281	£369.00	
A3000 89 Mb	N/A	-----	5282	£489.00	
A3000 105 Mb	N/A	-----	5283	£599.00	

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UPGRADE PROBLEMS WITH NEW ACORN PC EMULATOR

THE ENTHUSIASM which greeted last month's release of Acorn's long-awaited new multi-tasking Risc OS *PC Emulator* could prove to be short lived for many users of the previous emulator.

Supplies of the new emulator package were still in short supply at the time of going to press and Acorn also revealed that not all *PCE* users will not necessarily be equal.

Obstacles lie in the way of those wishing to take advantage of Acorn's £29 upgrade offer. Trips to your local Acorn dealer may end in disappointment – Acorn is handling the upgrade scheme for existing *PCE* users exclusively from its Cambridge offices.

Acorn has been happy to promise supplies of the new *PCE* software for users of the old *PCE* who are registered as having bought the stand-alone

package, which was supplied with Microsoft MS-Dos.

Unfortunately, customers who bought the Archimedes Learning Curve were supplied with a Digital Research DR-Dos *PCE* package and Acorn has to currently turn away users who wanting to upgrade. To confuse matters even further, some dealers have been splitting up Learning Curve packs and selling the DR-Dos *PCE* package separately – something which Acorn does not allow because of its restricted DR-Dos licensing agreement with Digital Research. Acorn says it will take tough action with any dealers caught splitting Learning Curve packs, although the practice appears to have largely ceased since a warning was issued by Acorn last year.

Why is Acorn discriminating between MS-Dos and DR-Dos? The explanation is that

Quality Assurance (QA) testing had only been completed for the *PCE* when used with MS-Dos. Indeed, the complete new *PCE* package is supplied exclusively with MS-Dos at present, although the £29 upgrade only includes the Risc OS *PCE* and does not include any Dos.

Acorn clearly does not wish to take a risk in supplying its new *PCE* to all-comers. Whether its policy to rush out the MS-Dos-passed *PCE* before the DR-Dos vetting had been completed was right or wrong will surely be debated for some time.

Until Acorn is confident with the DR-Dos version, thousands of its customers must weigh up whether they should wait or shell-out an extra £75 for the full package, including MS-Dos. Meanwhile, the message from Acorn is – be patient.

EDUCATION DIRECTORY READY

THE UPDATED edition of the *Education Directory*, listing over 1200 educational software titles available for the A3000/Archimedes range, has just been launched by Acorn.

At 230 pages in length, the second edition features many new titles, giving information on the programs, together with price and software house details. A titles' listing takes up 10 pages and there is also a 35-page section devoted to listing all the products in categories, both under educational subjects and by generic type.

Included are over 130 maths-based programs, 70 modern languages titles and over 70 different word processing and desktop publishing packages, as well as around 100 items of interest to the special needs sector.

Acorn's education business manager, Chris Humphries, said: 'For this latest edition we have updated the database of available programs and, following the useful feedback from our customers, we have made a number of improvements in the layout to make it even easier to use'.

The directory costs £4.95 and is available from Acorn dealers. For further information contact Acorn Computers on (0223) 245200.

GOODBYE!

It is with sadness that we note the passing on of *BAU* production editor Pauline McLemon.

From obscure beginnings as temporary editorial secretary, such were Pauline's talents that she rapidly rose to a position of not inconsiderable power. She worked under all the great editors – Tony Quirk, Graham Ball, Jeff Baines and, latterly, Berry Mink.

However, although as you can see, it has lost a production editor, *BAU* has gained an Attic Acorn correspondent.

She never missed a deadline but we will miss her.

NEW IRLAM SCANNER

IRLAM Instruments has introduced a professional colour scanning system for the Archimedes.

The Image Professional will include an A4 flatbed colour scanner, a podule and software. The scanner is capable of scanning up to 300dpi in monochrome, 256 grey scales or full colour. A full colour scan is said to take around four minutes and, because the data is processed and compressed during scanning, the sprite will be ready to save immediately.

The software will support a number of file formats, including 24-bit TIFF files and Irlam's own 24-bit file.

The software also has colour processing routines built in and will allow gamma correction. A further package will allow image processing and colour changes.

Contact Irlam Instruments on (0895) 811401.

ARCS KEEP ON TRUCKIN'

VISITORS to the BBC Acorn User Show in October will not fail to miss a rather large and dominant pantechicon parked out in front of the Wembley Conference Centre. The vehicle in question (pictured below) is the latest addition to Acorn's 'range' and will be filled to the gunwales with products.

Working in conjunction with dealers, Acorn is currently putting the final touches to plans for a massive sales programme at the show, with specially trained customer care staff, low-rate finance schemes and other incentives.

The mega-mobile warehouse will be a cornerstone of the operation, ready to satisfy demand from the thousands of visitors expected to attend the show.

Watch out for more details in next month's issue.



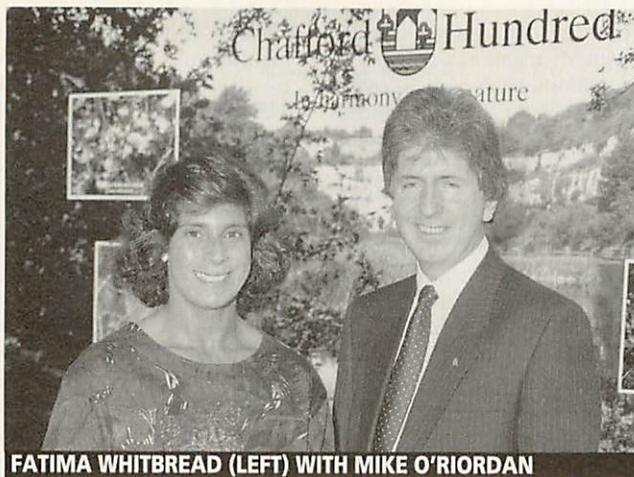
ACORN SUPPORTS SCHEME FOR YOUNG ATHLETES

ACORN has agreed to sponsor the Chafford Hundred Athletic Club, whose patron is star javelin thrower, Fatima Whitbread. The club, based in Thurrock, Essex, was set up to support and promote young up and coming British athletes, especially those who may have come from disadvantaged backgrounds.

The deal, said to be worth a six figure sum over the two-year sponsorship period, will guarantee the involvement of famous names from the world of athletics.

Stars including Linford Christie, Colin Jackson, Steve Backley, John Regis, as well as Fatima Whitbread herself, will be making personal appearances at various Acorn events. The first major event will be the *BBC Acorn User* show in October.

Acorn's background in supplying education and the Chafford Hundred cause appear to fit well together.



FATIMA WHITBREAD (LEFT) WITH MIKE O'RIORDAN

Fatima Whitbread commented: 'The technical expertise of Acorn, coupled with details of our training activities, create a combined programme that is both interesting and educationally stimulating for the country's up and coming young athletes.' She also cited Acorn's track record in special needs education.

Acorn's marketing director, Mike O'Riordan, said: 'We have a common aim - to help children attain their full potential in education and sport.'

'We are therefore delighted to form this partnership with the Chafford Hundred athletes and look forward to working closely with them over the coming months.'

NEWS IN BRIEF

● **IF YOU** are thinking of attending the BBC Acorn User Show, due to take place at the Wembley Conference Centre from October 11 to 13, then why not save money by applying for tickets now?

Prices are £5 for adults, £3 for under 16s (under fives are free) and £13 for family tickets (two adults and two children). Tickets will be available on the door at £6, £4 and £16 respectively.

Applications for advance tickets and further information should be sent to: Safesell Exhibitions Ltd, Market House, Cross Road, Tadworth, Surrey KT20 5SR.

● **CALLING** all budding software programmers. A new software house, called Papyrus Software, is planning to develop new games for the Archimedes and wants to hear from readers who would like to earn money from their talent. Contact Sholto Fisher, Papyrus Software, Craghead Cottages, Clappersgate, Ambleside LA22 9NA.

● **A HIGH** Density disc interface for the Archimedes is being planned by Arxe Systems. The product will comprise of a card which will hold the new disc controller system and a 2Mb high density disc drive.

The system has been designed to replace the normal ADFS system for floppies, and is provisionally called QuadFS. The company is looking to include additional functionality and would welcome suggestions from readers.

Contact Arxe Systems Ltd, Dept A2, PO Box 898, London E7 9RG. Tel: 081-534 1198.

● **DT SOFTWARE** has announced a two new image scanners for the Archimedes. Based around either the Epson GT-4000 or GT-6000 scanners, with a custom high-speed parallel interface to transfer images quickly into the machine, the scanners offer: 400dpi or 600dpi; mono scanning up to 256 levels of grey; selectable dropout colour; colour scanning in 3-24bpp; dithering for the modes with few colours and full Risc OS compliant software.

The prices are £1299 (GT-4000) and £1699 (GT-6000). Contact DT Software, Freeport, Cambridge CB3 7BR. Tel: (0223) 841099.

● **LOOKING** for new software? Then see our Software Showcase which starts on page 125.

ECONET TESTER

HAVING problems finding and rectifying faults on your Econet network? Then Alsystems could provide you with a First Line of Attack, or 'FLAT', test box.

Designed for the absolute beginner, the FLAT box features include:

- A 'drop lead' tester to detect cable breaks and short circuits, as well as cross-over connections.
- Multimeter sockets which allow one-handed operation when measuring cable resistances.
- LEDs which permit monitoring of both clock and data signals for faults.
- A Filestore internal clock test facility.

The FLAT box costs £75 plus £2.35 p&p and is available from Alsystems, Tel: (0420) 87213.

NEWSHOUNDS ON TRAIL

SCHOOL may be over for the summer, but pupils from one Cambridge school will be gearing up for a hectic new term of activity - and making news at the same time. Pupils from St Bede's School in Cambridge are keen fans of desktop publishing and produce various newsletters, posters and other documents using ESM's Desktop Folio DTP package.

Pupils from the school will be acting as 'newshounds' at the BBC Acorn User in October, producing a show newsletter full of news and gossip from the show. So watch if you are going to the show - they could be on your trail!



The best just got better.



Introducing the new Star LC-20.

Pedigree counts.

The new Star LC-20 is the direct descendant of the LC-10. A printer whose critical acclaim was only exceeded by its popularity with its users.

The LC-20 continues the family tradition as a monochrome 9-pin printer, ideal for home users, small businesses, education and departments within major organisations.

Its solid looks tell you that this is a printer strong enough for the toughest applications.

But the LC-20 also offers you a better performance. Not only is it faster than the LC-10, you'll also find it quieter.

Its features are everything you've come to expect from Star. But the most distinctly traditional thing about the LC-20 is its price. So easy on the pocket, you just won't believe how good it is.

But then the LC-20 does come from a good family.

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people not machines.**

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Company

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Or call the Sales Information line on (0494) 471111.



HMSO preferred.
For information, ring (0603) 695256.

Specifications: 9 pins • print speed - 45 cps at 12 cpi (NLQ), 180 cps at 12 cpi (draft elite) • 8 NLQ fonts (including italics) - Courier, Sanserif, Orator-1, Orator-2 + draft • 4kb print buffer • push tractor feed/short form tear off • paper parking.

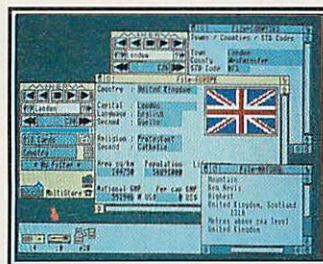
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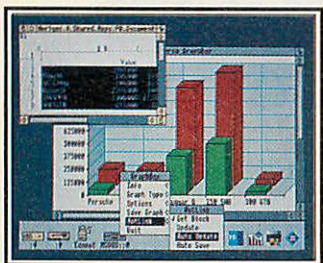
MULTISTORE The ultimate in database technology. A powerful database for the business or serious home user. MultiStore is a multi-tasking relational database which allows many database files to be opened at one time. Files may be linked so that relationships between files are automatically tracked. Rapid searches by any criteria, including 'sounds like' facility. Key fields for instant search, indices to allow file browsing in more than one order without sorting. Fast sort facility by single field or complex expression. Comprehensive reporting facilities allow any report, including totalled lists of fields, labels with multi-font capability, line trapping, justification, paging, multi-set stationery and even completely relational reports. Data can easily be exported to other RISC OS packages. MultiStore is a professional package and probably the most comprehensive database available today. **£305.50 inc V.A.T.**



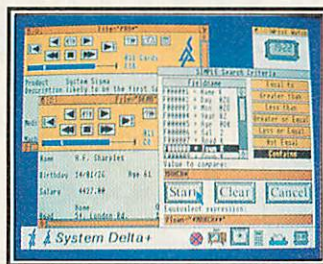
FLEXIFILE The perfect database for education and small business users. FlexiFile is a new powerful multi-tasking database with friendly screen displays. Multiple files may be open at the same time with relational linking between any two files. FlexiFile allows fast sorts to be carried out and with its soundex searching allows even mis-spelt items to be found. Mathematics can be performed using the macros while indices allow you to browse the records in more than one order without performing sorts. FlexiFile lives up to its name giving the user full flexibility with ease of use. **£153.22 inc V.A.T.**



SYSTEM DELTAPLUS The database for the serious home user or enthusiast. System DeltaPlus is a comprehensive database giving you power coupled with ease of use. Easy to use video style controls and the ability to define your own card layouts make this database suitable for all types of data entry. Searches can be performed by simply selecting from within windows or by multiple criteria. Reports can be produced together with labels up to four across with blank line strip. With comprehensive maths, sorts and searches System DeltaPlus is hard to beat. System DeltaPlus may be programmed if required allowing you to customise the package or write your own applications. **£81.69 inc V.A.T.**



GRAPHBOX * Data can be imported from the Minerva range of databases to GraphBox and stunning charts produced. With twenty different charts and graphs you will always be able to present your data to its best. GraphBox also imports data from other RISC OS packages. With a 'Hot Link' to Pipedream 3 which allows for automatic updating of graphs from data produced and the ability to export charts as draw files. Graph Box is the answer you have been looking for. * Graphbox is not a database, but can be used with any of the above programs for reproduction of charts and graphs. **£81.69 inc V.A.T.**



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MORE MICROS IN SCHOOLS

A DES SURVEY published last month showed an increase in the number of computers in schools, and in IT expenditure.

Carried out in 1990 on a representative sample of schools, the aim was to calculate the current level of provision for IT in education, and to determine its contribution across the curriculum.

There were on average four micros per primary school, and 41 micros per secondary school, compared with two and a half and 23 respectively in 1988. The pupil:micro ratio has in turn been reduced to 40:1 in primary schools and 18:1 in secondary schools.

The most commonly found microcomputers in schools were made by Acorn. This information is confirmed by an independent market research survey which found Acorn machines in nine out of every 10 primary and secondary schools. Moreover, 72 percent of LEAs recommend Acorn computers for school use, with 74 percent of schools actually buying Acorn products in the second half of 1990.

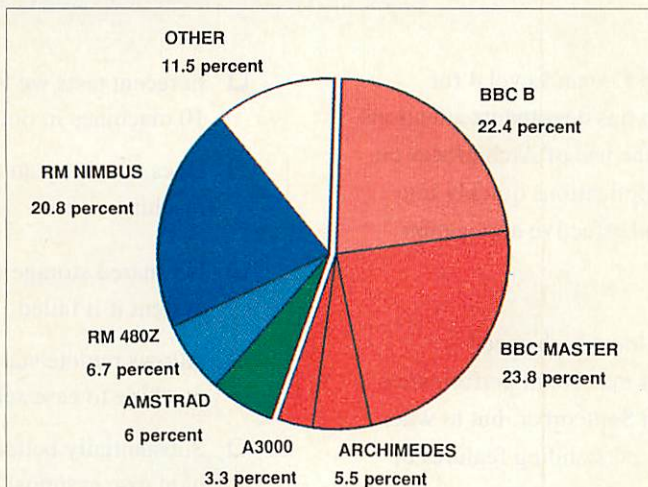
School spending on IT has doubled since 1988, with over 60 percent of the money spent on primary schools, and 81 percent on secondary schools, coming from public funds.

For most schools the LEA was the main source of technical support, as well as the most frequent source of software. The percentage of staff attending initial awareness training days since 1988 has also increased. However only 50 percent of staff across the curriculum felt confident in using IT with pupils. For more information ring 071-934 9140.

SCIENCE CHALLENGE

A new series of *Science Challenge* will be broadcast on BBC 2 from 17 September, writes David Watkins, BBC Education Officer.

The ten 20-minute programmes cover science, technology and IT at key stage 2. Each week four children are set a science-related challenge,



MICROCOMPUTERS IN SECONDARY SCHOOLS

such as investigating the principles of sound and light. Two of the children then go to an island to explore the problem, the other two remaining in headquarters to research information from books, pictures and a hypermedia database stored on computer. The work of programmer Paul Vigay enables the children to access and analyse the data – maps, sounds, digitised images, video sequences, and text – in a Wimp environment.

The audiovisual link between the island and HQ is provided by computer system, using a Hawk V9 expansion card to display real-time pictures. The software could have been run on an A3000, but because of studio requirements an R140 fitted with an ARM3 upgrade and genlock was used instead. Moreover, as standard Risc OS icons are too small for classroom viewing, an alternative desktop was used.

On 18 September there is a teachers' programme, to show how the series can be used to generate ideas and stimulate classroom activities. It features a number of schools working on science projects related to topics raised in the series, focusing particularly on classroom management.

The programme will be broadcast on Tuesdays at 11.35 am so don't forget to set your video. To order the teachers' notes and a pupils' book,

ring 081-746 1111 or write to BBC Education Information, London W5 2PA. BBC Schools programme information is also available on the Neris database, Tel: (0525) 290364.

MULTIPLE SOLUTION

Oak Solutions has an answer for teachers facing the problem of delivering large Archimedes applications to multiple machines via Econet.

A Classroom, attached to each computer on the network, provides a convenient means of storing applications locally, leaving the file server free to do what it does best – serve users with files.

ClassRoom resembles a hard disc in that it installs two icons on the icon bar, but one of these is a read only area where applications are stored, and the other is a read/write area for the user's temporary data. A Risc Os compliant manager's tool enables the teacher to update either area on a Classroom, and then to use Econet to transmit a copy to other ClassRooms on the network.

The hardware does not need a dedicated master machine, and so leaves all the computers free for use. Prices start at £315 for a 20Mb Classroom. For more details contact Oak Solutions at Cross Park House, Rawdon, Leeds LS19 6HA. Tel: (0532) 502615.

Sharon Halpern

NEWS IN BRIEF

● **QUESTION MARK** Computing has cut the price of its school version of Question Mark. The program, which computerises tests and exams, can be used on the Archimedes with a PC Emulator. It will enable teachers to save time as the computer will mark the input answers.

The new price for UK schools is £98. For more details contact QMC at 41b Brecknock Road, London N7 0BT. Tel: 071-284 3999.

● **WRITE TO SPELL** is a resource pack from Lame Duck Publishing, detailing a scheme to teach handwriting and spelling.

The teachers' notes are supported by two programs. Big Print is a simple wordprocessor with a large text style for children to copy, while Write to Spell is a flexible database that will hold letter strings and produce individually tailored spelling sheets. Record keeping sheets are also included, in line with National Curriculum requirements.

The pack costs £16 from Lame Duck Publishing, 71 South Road, Portishead, Bristol BS20 9DY.

● **IDENTIFICATION**, Interrogation and Field Work are the three sections that make up Hedgerow, a software package to help pupils at key stages 2, 3 and 4 explore the vegetation in their immediate environment. The accompanying activity pack contains teachers' notes, worksheets and photocopiable masters.

Available for BBC B and Master computers the software costs £16.75, and the activity pack £7.75. For more details contact Mercury Educational Products, 8-10 Lower James Street, London W1R 3PL. Tel: 071-287 5060.

● **EMR'S** Computer Music Learning Centre offers an opportunity for teachers to gain practical experience of its music software and hardware before using them in a classroom environment.

A range of tailored courses are available, focusing on hands-on teaching of Studio 24 Plus, the MicroStudio program and the Arpeggio Music System. The centre caters for classes of up to six – this can be six teachers or five pupils accompanied by an adult.

For more information contact EMR CMLC at Suite 2, 50 Hamlet Court Road, Westcliff-on-Sea, Essex SS0 7LX. Tel: (0702) 348406.

Turbocharge your Network with

CLASSROOM

Since completing development work on Econet Level 4 for Acorn, our Network Development team has devoted its attentions to the remaining problems concerning the use of Archimedes on Econet, namely, the delivery of large applications quickly into machines, efficient network printing and effective application management in the classroom.

Our solution, CLASSROOM, includes a local high speed applications server on each machine for maximum performance and versatility. It will be available from September, but to whet your appetite, here are just a few of the outstanding features of our new system:

- ☐ Full Network facilities - not simply a shared hard disc system.
- ☐ Utilises your existing Econet cabling, file servers and interfaces, AND leaves the A3000 internal expansion bus free for User/Analogue ports etc.
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- ☐ In recent tests we loaded !Impression simultaneously into 10 machines in only 5 seconds.
- ☐ Does not tie up an Archimedes as a dedicated master machine.
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- ☐ Allows machines to be remotely configured, reset and tidied up at the end of each lesson.

If you are interested in Archimedes on networks, do not miss this exciting solution to your problems.

Network Printing to Laser Direct

Now, at last, it is possible to use Computer Concepts' Laser Direct printers across Econet. Our new ClassPrintLD software package allows the Laser Direct printer to be accessed via any Archimedes on the network by providing a new printer driver for each machine. All print requests are then sent via the network, rather than directly to the printer. The machine connected to the printer runs a printer spooler which receives the data from each machine, stores it locally, and then prints it in the background, when the printer is free. The big difference between this and conventional network printing techniques is that the printer driver compresses the information before sending over the network. For a typical DTP page (such as this advertisement) compression ratios of 8 to 1 can be achieved. Messages such as 'Paper tray empty' and 'Toner out' are sent back to each user across the network.

ClassPrintLD network licence £75.00 (Available Sept 1991)

Hard Disc & Network Backup

For professional backup of data under Risc OS, Oak Solutions' tape backup systems provide the ideal answer to all your problems. All our tape backup systems include !OakTape, our comprehensive and widely acclaimed Risc OS backup software, now in version 2 form. Backups are done on a file-by-file basis with versatile control over backup criteria. Automatic backups may be triggered at pre-determined times, and printouts of tape contents can be automatically generated. Restoring from tape is simple and intuitive. Files and directories can simply be dragged from a tree viewer, or directory viewers, either to disc, network or even directly into an application! Our backup systems are ideal for use with Econet, and can back up ALL types of file servers. Our wide range of tape backup systems starts at under £600. Please telephone to discuss your requirements.





CONTROLLING YOUR OWN

As revealed in previous columns the BBC is an ideal computer to control a BB, especially as you can now pick up second-hand BBCs for as little as £50. Add a hard disc and a modem and you are ready to start your own BB.

There is now a new host system for the BBC available. Joel Rowbottom's *JoelBBS* has been written to help fill a gap in the BBC software market, providing a cheap and comprehensive bulletin board host system for the BBC.

For £25 *JoelBBS* offers full support of viewdata and true Ansi. At this price it should get the competition seriously worried. The file transfer section of *JoelBBS* has been closely modelled on Hugo's *ArcBBS*, and provides full support of XModem, XModem-1k, YModem and CET.

These routines were written by fellow comms enthusiast Gareth Babb and are supplied on Rom for speed and memory. *JoelBBS* supports over 50 different frame variables for viewdata access, together with code to enable you to run your own online auctions, world clock and online frame editor. Full message facilities, downloading and frame view capabilities are all included.

The scrolling system will also display *ArcBBS* menus and textfiles. It even takes into account the enhancements added by Ansi, and allows the user to choose their terminal from VT52 or VT100. Again full menu variables are supported, and full file transfer and message-conferencing is catered for. You can link into external programs, and a number of enhancements will be added over the next few months.

JoelBBS will run on any BBC B or Master 128 but it does require a minimum of 16K of sideways Ram to hold the Rom image, and a Winchester disc, minimum of 5Mb. However do shop around as hard discs can be picked up surprisingly cheaply at compu-



CHALLENGING DOWNLOADS

ter shows and amateur radio rallies around the country.

A cheaper alternative to *JoelBBS*, featuring a scrolling environment but without the file transfer protocols and message systems, will be available for £10 – which is ideal for use in schools.

To find out more about *JoelBBS* contact Mad Rabbit Systems at 22 Oakwood Grove, Near Wakefield, West Yorkshire, or dial their viewdata service on 051-339 9166.

THE CHALLENGE

This month's bulletin board is called The Challenger. It is run by Richard Whitehand and located in Birmingham. Richard claims that it is one of the fastest viewdata boards around, and as it runs on an Opus Challenger Ram disc this claim may not be far wrong.

It has numerous computer specific areas, including coverage for Archimedes and BBC owners, as well as areas for PC, Commodore and Atari users, so you can see what the competition is up to. Large selections of downloads are available for both the Arc and the Beeb, under headings such as Ample files, games and utilities.

In addition numerous message areas allow you to swap views and comments with other users, as well as to place For Sale and Wanted adverts. There are also some nicely drawn viewdata frames.

The system as a whole is

easy to find your way around, and is simple to use. Challenger BBS is on 021-445 3919 and is open 24 hours a day.

TOP OF THE RANGE

Miracom, famed for its WS and Courier range of modems, has produced two new models to add to its Courier range. The 2400Plus offers v22bis (2400/2400) and the 14.4Plus offers everything up to v32bis. Both include MNP4+5 protocols, together with v42/v42bis error correction and compression. V25bis commands are also supported. The models cost £895 and £495 respectively. For more information contact Miracom on (0473) 233888.

USING THE PCE

A number of people have asked if PC comms software can be used under the PC Emulator, and the answer is yes. Any IBM AT modem cable should do. However, in case you can't find a lead I have listed the appropriate wiring in the table below.

Paul Vigay

Arc 9-way	Modem 25-way
1(DCD)	8(DCD)
2(RxD)	3(RxD)
3(TxD)	2(TxD)
4(DTR)	20(DTR)
5(Ground)	7(Ground)
6(DSR)	6(DSR)
7(RTS)	4(RTS)
8(CTS)	5(CTS)
9(RI)	22(RI)

NEWS IN BRIEF

● **WITH MANY** users now using Mercury, the following tip may help ArcTerm7 users to implement Mercury codes into their dial strings. Select Prefix from the options menu and choose a prefix. Then enter the code as follows: 131, 123456 7890. 131 will get into Mercury's network, and a comma makes the modem wait for a Mercury line. The following six digits and four digits are part one and two respectively of your Mercury number. Press RETURN to enter this data. Then all you have to do is modify your dialstore entry to use the required prefix.

● **DARCWORLD BB** has a new fast modem so that it can be accessed at all speeds up to 9600 (v32) with MNP5. As a consequence 12/75 (v32) is no longer supported. DarcWorld BB is on (0867) 577724 and runs on Hugo's ArcBB.

● **A NEW BB**, Architype, situated in Jersey, is the only Arc based BB in the Channel Islands. There are not that many files and messages yet, so log on and say hello on (0534) 54032, scrolling 8N1.

To attract users the sysop is giving the first 30 new users special privileges, such as a greater upload/download ratio.

● **A NEW** version of David Pilling's Risc OS Terminals Plus disc is available for £17.97, £11.98 if you upgrade from older versions. For this you get Kermit and Zmodem transfers, with an accurate VT220 emulator. Viewdata and Ansi are also catered for. Contact David Pilling at PO Box 22, Thornton Cleveleys, Blackpool FY5 1LR.

● **THE LATEST** version of Anthony Frost's ReaderS utility is now available. Tentatively called version 1.005, there are a number of bonus utilities on the disc. You can browse through and prepare offline replies to BB messages and Canaries, and it will add a random fortune cookie to your signature line. As ReaderS is Shareware, the RNLI and Cornwall Air Ambulance service will benefit from each sale. So far £180 has been raised. It costs £10 from Anthony Frost at 10 Whiterocks Park, St. Anns Chapel, Gunnislake, Cornwall PL18 9EF.

● **Procrastinet BB** has closed due to unforeseen circumstances. However James Coates, the sysop, is setting up a new system on a new number. Watch this space for more information.

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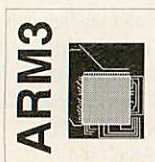
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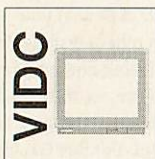
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 - 420/1 to 440/1 requires 2Mb
 - 410/1 to 440/1 requires 3Mb
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SAMPLER MAKES WAVES

HYBRID TECHNOLOGY has released ArcRecorder, a new sound recorder for the Archimedes that provides full eight-bit sampling. It uses an eight-bit converter, although another four bits are used to provide automatic level control.

Roughly the size of a dongle, it plugs into the printer port, although it does have a through socket so that you can still use your printer. The package has been designed for ease of use, and automatically performs many of the tiresome operations, such as removing leading silence, that are done manually on other samplers.

The number of controls is kept to a minimum, and the program operates in a continuous state of recording. It isolates each sound as it is recorded, and samples can be saved and then converted into relocatable modules to use in any Arc program which supports them.

It's likely that a full edit package, incorporating many of the simple-to-use features, will be developed to allow users to tweak their samples.

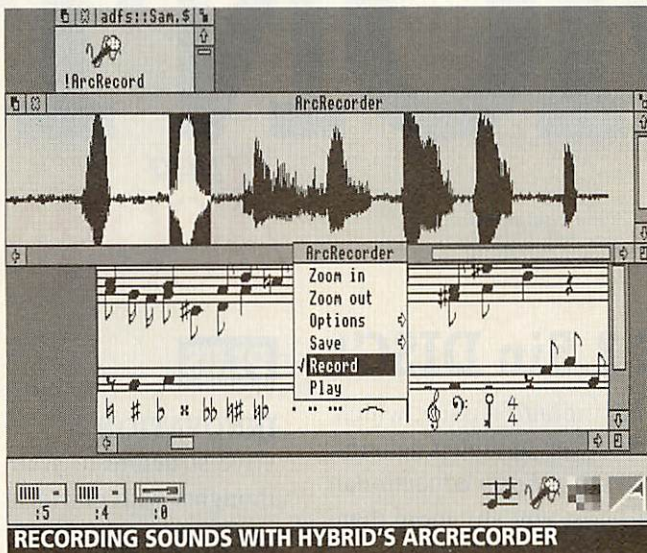
ArcRecorder is not aimed primarily at the musician but at all users who wish to experiment with sound. It should therefore find a home in education, for sound experiments, and Hybrid hopes that third party developers will use it for programs such as voice recognition and voice mail.

The package, including a microphone and desktop stand, costs £29.95 plus p&p. It is due for release later this year. For more information contact Hybrid Technology, 88 Butt Lane, Milton, Cambridge, CB4 6DG. Tel: 0223 861522.

● *Oak Solutions has now also released a low-cost eight bit sampler called ArcRecorder. See page seven to resolve the confusion.*

INSPIRATIONAL

As I revealed in July's column, *Inspiration* has been updated to version 1.03. The version reviewed in March *BAU* was 1.12, so presumably these



RECORDING SOUNDS WITH HYBRID'S ARCRECORDER

numbers have been down-scaled. If you buy it make sure that you get the latest version.

The good news is that most of the bugs have been fixed, leaving a more stable program. But it can still fall over – I tripped it up in the toolbox and the editor – though this is usable, which the earlier version wasn't. The transport and timing functions have been improved, and there are some sample tools to try, such as velocity increase, after-touch delete, velocity invert, and fade out.

It runs on any Arc without the need for the laborious configuration program, but though it can run in 1Mb of Ram this is not really enough – 2Mb is the real minimum.

Inspiration now saves Midi files, its natural file format, with the correct filetype. If you have some early version files you can convert them by altering the filetype from the desktop environment:

```
*settype <filename> fd4
```

You still can't edit the event list directly, and the documentation hasn't been updated. There is a rumour of a tutorial, although this rumour has been around for nine months!

Files still can't be saved in *Maestro* format, although this option is probably redundant now. It allowed you to view the file in music notation form but not to print it out, whereas

Rhapsody does both, and can also load files in Midi format.

The update is free to registered users, and a demo disc is available if you send a formatted disc and p&p. For more details contact *Inspiration's* Help Line which is being run by Sound Proposition, 44 Udney Park Road, Teddington, Middlesex, TW11 9BG. Tel: (0273) 725536.

ANOTHER LANDSCAPE

Another Landscape by John Bartlett is an Ample album release. Containing nine pieces, including *Rider in the Storm*, *Dawn*, and *Dusk*, it tells a simple story. Make up your own mind, but it seems to me that the underlying concept is not unlike Beethoven's *Pastoral Symphony*.

Rider in the Storm contains some of the best storm sounds I've heard on the Music 5000, and the other pieces invoke their own atmosphere. Each note and beat has been lovingly chosen, and placed for maximum effect.

The only thing I don't like is that the program automatically looks to drive 0 for the disc which is where I, like most people, keep my system disc.

It costs £3.95 from J B Software, 20 Crawley Avenue, Wellingborough, Northants NN8 3YH. Tel: (0933) 675392.

Ian Waugh

NEWS IN BRIEF

● **HYBRID TECHNOLOGY** has now released the Music 6000, and I have a review instrument on my desk. With its flexible goose neck and ultrasonic sensor it's reminiscent of the Martians in the War of the Worlds! Originally designed for users with special needs it's also absolutely amazing fun!

The ultrasonic sensor mounted on the top detects movement and converts it into sound. At its simplest it can play an upwards arpeggio when you walk away from it and a downwards one when you walk towards it. You can even use it to do Jean-Michel Jarre laser harp impressions!

More details in Acorn User soon. To contact Hybrid see main news.

● **PANDA IS** having a sale, offering three for the price of two on its full range of Panda Music discs. That's £6 for one, or three for £12. There are 16 discs for the Music 5000, three for the Music 500 and three for the Island Logic Music System. The offer lasts until Christmas 1991. For a list of all the tracks on the albums send an SAE to Panda Discs, Four Seasons, Tinkers Lane, Brewood, Stafford, ST19 9DE.

Panda Discs was launched to make Ample music available to a wider public. It's an offshoot of Ample DCT, a Viewdata BBS full of Ample programs, hints and tips. Log onto it on (0384) 239944 – it's well worth a look.

● **AS WELL AS** providing support for *Inspiration*, Sound Proposition is developing support modules, including a Track Save routine and an Arpeggiator. For more details see the address in the main news.

● **ALPINE Software** has released *UltraSonic*, a sound program aimed at games and demo writers. It runs on the Arc/A3000 and is fully Risc Os compatible and multi-tasking. It can handle four channels of stereo sound and support 32 instrument sounds.

The pack includes a program to convert samples from various formats including *Armadeus*, *MultiPod* and *SoundTracker*, and there is a PD playback module to blend sound effects with background music. Documentation is included to show you how to produce music from Basic. It costs £30 from Alpine Software, PO Box 25, Portadown, Craigavon BT63 5UT. Tel: (0762) 342510.

NEXT MONTH

BBC ACORN USER

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Chris Drage looks at how you can use computers effectively to manage classroom activity

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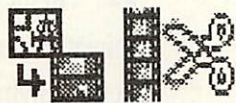
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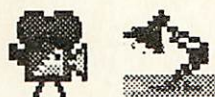


RISC OS Euclid is the best multi-tasking 3D graphics and animation system for the Archimedes. It is effectively a 3D version of Draw.



Mogul makes full use of **Euclid**'s unique hierarchical data structure to generate animations of 3D objects with articulated motion and simultaneous camera motion.

ArcLight is a multi-tasking ray-tracer which will generate a realistic **Euclid** picture, or a complete **Mogul** film, while you are free to get on with other work.



Tween produces films from Draw files. It uses techniques similar to **Mogul** and generates a film by calculating intermediate frames from a set of key positions.

Splice allows you to edit films produced by **Mogul** or **Tween**. You can even produce hand-drawn cartoons by converting sprites from any source.

Such is the enthusiasm for **Euclid** there is a user group called **Elements**, now in its second year, which provides a quarterly disk containing hints, tips, animations and user pictures.

ArcLight £50
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Mogul £20
Splice £30
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£15 STAR LETTER

I am prompted by the note in the Acorn Customer Hotline (*BBC Acorn User* July 1991) about using the PC Emulator for Open University courses, to reassure any other Archimedes or A3000 owners (or prospective purchaser) who may be thinking of taking an OU course.

I have been using the emulator this year for an OU course, and have found it perfectly satisfactory so far. However disc accessing operations seem to be slow and disc formatting is painfully so. It takes over three minutes to format and verify a Dos disc, and over 6 minutes for a P-system disc as used on my course, Fundamentals of Computing - M205. Fortunately the course does provide ready formatted discs!

Alan Beasley
Bexhill-on-Sea

A reason why your disc drive may seem slow is that you are using an old version of the PC Emulator. The latest versions now take account of the Step configuration of the floppy drive, which denotes how many milliseconds the disc takes to access the next track. For the internal drive this can be set to 3, by typing *Configure Step 3, which is the fastest. An external drive may need a slower speed. You can set this up separately. See *Configure Discs, and *Configure Step in your user guide for more details.

LOADSAPROGS

I was surprised by the letter in the August 1991 edition of *BBC Acorn User* from S J Elliot expressing concern over the lack of software for the Archimedes and A3000 computers.

Undoubtedly this was the position twelve to eighteen months ago, but the position has changed dramatically since that time. As my sphere of concern is with education, I will focus on this area, but similar statements apply to other areas as well.

The second edition of our Education Directory released

last week lists over 1,200 educational software titles specifically available for the A3000 and Archimedes range of computers. Comparison with similar directories for other manufacturers, including Apple, Commodore and MS-Dos computers clearly shows that the software available for Acorn systems is more than comparable with both the range and quality of software for other systems.

At 230 pages in length, and with over 130 Maths-based programs, 70 modern languages titles, and over 70 different wordprocessing and desktop publishing programs out of the hundreds of listed titles, this directory testifies to the extraordinary productivity of the more than 300 UK software houses that produce titles for the A3000 and Archimedes.

S J Elliot also expresses concern that there is insufficient new and innovative software under development for Risc OS systems. I would first point out that of the twelve annual Educational Technology awards made at the BETT shows in January 1990 and January 1991, eleven of the twelve awards were made to packages for Acorn computers, with only one going to a package only available for MS-Dos computers. No awards were made to software packages for other manufacturers systems.

Major new innovative developments continue, with at least fifteen new or about to be released packages on show at the Access IT conference for teachers at the beginning of July. And the majority of the new developments by these software houses will be available either only or first on Acorn Risc Os computers.

On the question of games, there are now more than 130 games available for both the A3000 and Archimedes, with major software publishers such as Domark, Virgin, Fourth Dimension, Minerva and Alien Images, all launching new 32-bit titles for Acorn computers in 1991.

I can only assume that S J Elliot has not been able to

obtain a copy of the first edition of our Education Directory, which sold out of its 10,000 initial print run in just over four months.

Finally, if there are any major areas of new software development which S J Elliot believes should be available for Acorn systems, we would welcome hearing about these directly, so that we can feed such ideas into our developers for their consideration. It is quite likely that many of the suggested ideas will already be under development for Risc Os.

Chris Humphries
Acorn

ACORN DOWN UNDER?

We have recently purchased 10 A3000's and have linked these with the existing 20 BBC Model B machines in a network providing a total of 30 stations. Unfortunately the Australian software market doesn't support the Acorn machines as well as it should and many old BBC retailers have fallen by the wayside.

Consequently I am searching for assistance from High School teachers and enthusiasts alike to supply some inexpensive software for both computers. After just spending \$25,000 on computer upgrades in the hardware department it leaves us with a small budget for software. The areas of particular interest are science and maths, simulations, music, adventures and teacher created software.

A final point: are there any schools in the UK that would like to be linked through either disc/postage or modem to our school in Australia?

Patrick Carswell
Chanel College
11 Patterson Street
Gladstone
QLD 4680
Australia

We are sure there are many teachers out there who have been in the same situation. Maybe you have some suggestions for Patrick? We are also sure there are many software houses that wish to bombard Patrick with information sheets about their products, to show that Aus-

tralia isn't that far away after all.

Look out next month for a special article on how to organise your classroom, and budget your school's computer spending.

TANDY TROUBLE

I am writing in response to the letter from R Howitt of Windsor published in the July issue.

I have a Tandy DMP200 operating successfully with a BBC Model B. I found I had to make up a special printer lead, as it seems the DMP200 is not quite Epson compatible.

The problem lies with the acknowledge line. This is normally pin 10 on the 36 way Centronics connector and is wired to pin 19 on the BBC's 26 way connector. By tracing the internal circuitry of the printer, and some experimentation, I decided that the signal is the logical inverse of what the BBC requires. Pin 11 has the correct polarity though.

The solution is to wire pin 19 at the BBC end to pin 11 at the printer end, leaving pin 10 unconnected. I used a solder terminal type of centronics plug and made all the other connections as shown on p406 of the BBC Micro user guide. It should be fairly straight forward though to fix up your old lead with a razor blade.

I don't know whether the same is true of other Tandy printers. Is it a cunning stratagem of Tandy to force owners of Tandy computers to buy Tandy printers?

Robert Stockton
Didcot

LINE UP

Contrary to both the supplied user guide and optional programmers manual, the Canon BJ10e printer does appear to support the ESC "J" reverse linefeed command.

Sending VDU 1,27,1,93 in either IBM X24E or Canon BJ130 emulation mode will reverse feed the paper by the currently selected linefeed pitch. It goes backwards the same amount that it goes forwards on receipt of a linefeed.

Paul Corke
Harleston

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Q When I press function key F12 from the Desktop in order to access the command line interpreter (CLI) I am a little confused as to the best way to return to the Desktop. Typing *DESKTOP does not do the trick. all I get is a blank window on the screen. What is the correct way to get back to the Desktop please?

Alan Watt
Nottingham

A The quickest way to return to the desktop from the command line interpreter is to simply press RETURN at the star (*) prompt. This will take you straight back into the Desktop. Typing *DESKTOP will return you to the desktop, but will need an extra press of the RETURN key. This is because the *DESKTOP command expects you to put another command after it.

Q I keep reading and hearing about SID. I know it is nothing to do with the privatisation of British Gas but something to do with information about the BBC range of computers. Can you tell me more? I have an Archimedes, a modem and comms software.

A SID stands for Support Information Database. SID is an on-line database available on its own dedicated telephone line or through a gateway from Prestel. Anyone with a modem and appropriate communications software can access SID. You can dial up SID straight away on

QUESTIONS AND ANSWERS

(0223) 243642. The database is in viewdata format on standard V23 protocol (1200/75 baud, 7 bits, even parity, 1 stop bit). As you would expect, all material on the system is exclusively for users of Acorn micros. It is a good place to look for PD software.

Q I have been recently purchased a second-hand modem to use with my BBC Model B computer. As you may expect, the modem had no instruction manual and the chap in the shop was unable to give me any real operating instructions other than 'I expect you just connect it up to a computer and it will go!' I'm convinced I have a bargain but the only information I really have is that the modem is manufactured by GEC Information Systems. What help can you offer?

John Yeaman
Dundee

A GEC has made a number of modems suitable for the BBC micro over the last six years, some of which

have been badged by other companies. One of their popular own make modems was the DataChat 1223 which had quite a following with BBC users.

It is a good idea for you to contact GEC Telecommunications Ltd at PO Box 53, Coventry, CV3 1HJ giving them the fullest details of the modem. If possible sketch the front panel and check if there are any references on the printed circuit board you can quote.

As an introductory text you may find *The Communication Guide to the BBC Micro: The Hacker's Handbook* by Geoff Wheelwright and Ian Scales, published by Longman, ISBN 0-582-91614-3 an ideal book to get you going.

Q I am more used to desktop publishing on Apple Macs and IBM PC machines than I am on the Archimedes. I have now been using the Archimedes for a month for a freelance publishing task and I am already convinced that

packages like *Impression* are tremendously powerful.

However I do get a little bit confused over the use of different names for outline fonts rather than their Postscript ones. Can you provide a list of their equivalents.

Tom Senior
Poole

A The Electric Font Foundry publishes an extensive list of the Postscript equivalent names of their fonts. This can be obtained from EFF, Bridge House, 18 Brockenhurst Road, Ascot, SL5 9DL.

Here is a brief list of Acorn, Computer Concepts and Beebug outline fonts and their Postscript equivalents.

Corpus	Courier
Trinity	Times
Homerton	Helvetica
Newhall	NewCentury Schoolbook
Selwyn	Zapf Dingbats
AvantG	AvantGarde
Pembroke	Palatino
Vogue	AvantGarde
Paladin	Palatino
SwissB	Helvetica
SymbolB	Symbol

Q I know the concept of filetypes is very important in the Risc Os environment and I understand it is how Risc Os knows what to do with a file when you double click on its icon.

I am familiar with what the manual has to say about setting filetypes but I am convinced that there must be an easier way. Is there?

Bill Pringle
Street

If you have a particular problem with an Acorn micro, commercial software or a program you are trying to write yourself, then BBC Acorn User might be able to help. The BAU Post A Problem service guarantees to give you a personal answer to your problem within 10 working days – and for just £4.

Write out your problem with as much detail as possible and, if a program is involved, include a disc or cassette. Fill in the coupon and send it and your problem along with a cheque or postal order for £4 (including VAT) made out to Redwood Publishing. If you require recorded delivery, please add the cost of this.

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A What you obviously need is a small utility program that enables you to set filetypes from the desktop. One such program called *Filetypes*, is available on Beebug's PD software library disc 28.

Once loaded on the icon bar you click Menu over *Filetypes*'s icon and enter a file type number or name. An icon representing the file type will appear on the icon bar and if you drag a file to one of these icons, its file type will be set to that of the icon.

If you drag a file to *Filetypes* itself, then its file type will be used to create a filetype icon.

Q I am considering selling my unexpanded BBC micro Model B. I believe it is an Issue 1 board and it still has the original operating system 0.1 and Basic 1 installed. I would be interested if you could give me your opinion as to its value.

O F Suleman
Manchester

A It is not easy to give a value for your machine without examining it. However some points about your machine in comparison to the normal machines offered for sale are well worth considering.

Your system has not been upgraded to the standard operating system which is now version 1.2. It also still has the original BBC Basic. The standard language is now Basic 2 for BBC model B machines.

The final issue of the BBC Model B was Issue 7. Your machine is also without the circuitry for disc operation and does not have the DFS chip installed.

After examining the second-hand section of a number of magazines I have established that a reasonable condition BBC model B with an issue 4 board and DFS installed should fetch about £150. On the other hand a good condition BBC Model B with an issue 7 board and DFS would be worth anywhere from £180 to £200.

Q I really thought wordprocessing was going to be the answer to all my letter and report writing problems. I am finding that with the BBC micro, an Epson FX printer and the *View* wordprocessor program I am encountering more problems that I can reasonably cope with.

For a start I just cannot get bold printing and I cannot get the underlining to work. I know the printer can perform these things but my computer and its current wordprocessor can't or won't!

M C Whitcroft
Bath

A To obtain special effects like bold and underline with the *View* wordprocessor you need to have loaded a special program called a printer driver.

The official Acornsoft driver can be obtained from any Acorn dealer and it does include an easy to follow manual.

Over the years *BBC Acorn User* has published a large number of suitable printer drivers, one of which will meet your needs.

Q I'm looking for a piece of software that will enable me to create font effects like text in circles. I want to use them when undertaking DTP work on the A3000. Is there a package that does this automatically?

Paul Spencer
Bearwood

A The best font effect program on the A3000 is probably *FontFX* published by DataStore Software, 6 Chatterton Road, Bromley, Kent, BR2 9QN.

It costs £9.95 and allows text to be scaled, rotated, sloped at a specific angle, and arranged in an arc, circle or column.

It is also possible to use *FontFX* to add a shadow behind or below the text, add an outline to the letters and choose different colours. Other sources of font effects are Ian Copestake's *Drawbender* and *Poster* from 4mation, both of whom advertise regularly in *BBC Acorn User*.

ACORN CUSTOMER HOTLINE

A number of people who purchased BBC systems many years ago also purchased Epson MX 80/100 printers. The following information will enable you to change the *PrinterDM* application supplied with the Archimedes and BBC A3000 to drive the MX series correctly.

Make a copy of the *PrinterDM* printer driver application on a new disc. Do this by formatting a blank disc and dragging the *PrinterDM* application from the window for your applications disc to the window for the new disc. Now load the *Edit* application, which you will need to alter the settings inside the printer driver application.

Hold down the SHIFT key and double click on the copy of the *PrinterDM* which will open a window showing the files that form the application. The file *PrData* is the one that needs to be altered, and this can be dragged to *Edit*'s icon. The *PrData* file is designed to be readable by both humans and the *PrinterDM* program and you should be able to locate the settings for various types of printer. There are 13 printer types supplied as standard and we will add a further two by entering the attached text at the end of the settings and before the line 'Page Size Settings'. When you have done so save the *PrData* file.

You can now start your new *PrinterDM* by double clicking on its icon. When the driver is loaded click select once on its icon on the icon bar. This opens a small window which displays the current driver setting, and clicking on the printer name will cycle you through all 15 possible printer types, and do so until you reach the MX drivers. You may wish to choose save settings from the menu on the printer drivers icon, so that the driver will automatically start with the MX driver selected. The file is too wide to print here so the end of a line, is denoted by a ¶ character, when you see this character do not type it, but press RETURN.

```
printer_name: EPSON MX
compatible (72 by 72 dpi)¶
printer_number: 13¶
pxres: 72¶
pyres: 72¶
pxres_half: 72/4¶
```

```
pyres_half: 72/4¶
dump_depth: 8 ; 8 pin¶
line_prologue: "<27>K"¶
line_epilogue:
"<27>A<0><13><27>A<8><10><2-
7>2" ; move down 8/72 inch¶
job_epilogue: ""¶
.....
printer_name: EPSON MX
compatible (144 by 72 dpi)¶
printer_number: 14¶
pxres: 144 ; dots per inch¶
pyres: 72¶
pxres_half: 144/8¶
pyres_half: 72/4¶
dump_depth: 8 ; 8 pin¶
line_prologue: "<27>L"¶
line_epilogue:
"<27>A<0><13><27>A<8><10><2-
7>2"¶
job_epilogue: ""¶
.....
```

We often receive requests for further information from people wishing to design and build interfaces and peripherals for their own use, or as part of a design project. There are many suitable books that can be used in conjunction with such projects.

The two most suitable ports on the BBC B/B+ and Master 128 are the user and analogue ports. There is a discussion of the use of these ports and how to write software that reads and writes to them, in *The New Advanced User Guide* by Dickens and Holmes published by the Cambridge Microcomputer Centre. Farnell Electronic Components and RS Components both list suitable book titles in their catalogues. Specific BBC based titles such as *Interfacing with the BBC Micro* will probably be of use.

It is possible for the mouse supplied with the Archimedes and A3000 computer systems to be used with the PC Emulator. This requires your Dos disc to contain the file *mouse.sys*.

It is normal for any Microsoft package to include a mouse driver. If you do not have this file you will have to copy it onto your own Dos disc.

Once you have the file on your Dos disc you will have to amend the *config.sys* file with the following line:

```
device=mouse.sys
If you are unsure of how to do this the instructions are on page nine of the PC Emulator booklet.
```


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Problem: Write a RISC OS desktop application that opens a window when select is clicked on the iconbar icon. The window must contain an icon with a border and the word 'Beep' inside it. The computer should beep when the mouse is clicked over this icon.

The BASIC Way	The Easy Way
<p>Enter BASIC by typing *BASIC from the command line</p> <p>Type in the following BASIC program:</p> <pre> 10REM < Beep\$Dir>.!Runimage 20ON ERROR:ERROR:EXT ERR,REPORT\$:* at *STR\$ERL 30DIM block% &100 40DIM sprite_buf% 12 50DIM icon_buf% 40 60DIM block2% &100 70REM initialise the wimp and create the task 80SYS "Wimp_Initialise",200,&4B534154,"!Beep" TO ,task_handle% 90REM create the iconbar icon 100\$sprite_buf% = "!beep" 110icon_buf%!0 = -1 120icon_buf%!4 = 0 130icon_buf%!8 = 0 140icon_buf%!12 = 80 150icon_buf%!16 = 82 160icon_buf%!20 = &2182 170icon_buf%!24 = sprite_buf% 180icon_buf%!28 = 1 190icon_buf%!32 = LEN("!Beep")+1 200SYS "Wimp_CreateIcon",,icon_buf% TO icon_sprite% 210REM make the window 220w% = block% 230REM visible work area 240w%!0 = 0 :REM min x = 0 250w%!4 = 0 :REM min y = 0 260w%!8 = 550 :REM max x = 550 270w%!12 = 256 :REM max y = 256 280REM scroll offset 290w%!16 = 0 :REM scroll x = 0 300w%!20 = 0 :REM scroll y = 0 310REM handle to open behind 320w%!24 = -1 :REM on top 330REM window flags 340w%!28 = %100001110000000000000000000000010010 350REM set up the colours 360w%?32 = 7 :REM title foreground 370w%?33 = 2 :REM title background 380w%?34 = 7 :REM work area foreground 390w%?35 = 1 :REM work area background 400w%?36 = 3 :REM scroll bar outer 410w%?37 = 1 :REM scroll bar inner 420w%?38 = 12 :REM input focus title bar 430w%?39 = 0 :REM reserved - must be 0 440REM work area 450w%!40 = w%!0 :REM min x 460w%!44 = w%!4 :REM min y 470w%!48 = w%!8 :REM max x 480w%!52 = w%!12:REM max y 490REM title bar icon flags 500w%!56 = %0010111000000000000000000000000111001 510REM work area button type 520w%!60 = 0 :REM ignore all clicks 530REM sprite area control block pointer 540w%!64 = 1 550REM min window width - x,y 2 byte coords 560w%!68 = 0 :REM means use title width 570REM min window height -x,y 2 byte coords 580w%!70 = 0 590REM title data 600\$(w%!72) = "Beep Window" + CHR\$(0) 610REM number of icons 620w%!84 = 1 630REM bounding box for icon 640w%!92 = 10 650w%!96 = 150 660w%!100 = 150 670w%!104= %011100000000000000000000000000011101 :REM flags 680\$(w%!108) = "Beep" 690SYS "Wimp_CreateWindow",,w% TO window_handle% 700REPEAT 710 SYS "Wimp_Poll",,block% TO action% 720 CASE action% OF 730 WHEN 2: SYS "Wimp_OpenWindow",,block% 740 WHEN 3: SYS "Wimp_CloseWindow",,block% 750 WHEN 6: CASE block%!8 OF 760 WHEN 4: !block% = window_handle% 770 SYS "Wimp_GetWindowState",,block% 780 block%!28 = -1 790 SYS "Wimp_OpenWindow",,block% 800 WHEN 2: CASE block%!12 OF 810 WHEN -2: SYS "Wimp_CloseDown",task_handle%, "TASK" 820 WHEN window_handle%: VDU 7 830 ENDCASE 840 ENDCASE 850 WHEN 17,18: IF block%!16 = 0 THEN 860 SYS "Wimp_CloseDown",task_handle%, "TASK" 870 ENDIF 880 ENDCASE 890UNTIL FALSE 900END </pre> <p>Create a directory called !Beep</p> <p>Save the program as !Runimage into the directory</p> <p>Create a !Sprites file containing a sprite called !Beep</p>	<p>Run Genesis II by double clicking on its icon</p> <p>Drag the new application icon from the Genesis icon bar menu, into a directory display</p> <p>Drag open a frame in the window</p> <p>Type the word 'Beep' into the Info->Word menu option</p> <p>Double click on the 'select' icon on the new frame's 'Link to' dialogue box</p> <p>Type the word 'Beep'</p> <p>Click on OK</p> <p>Click on the 'Save Page' menu option</p>

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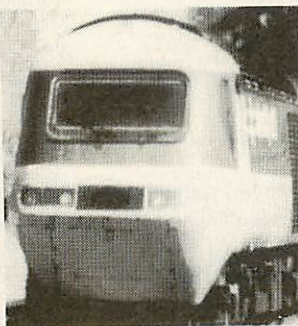
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Mogul	£17	Real McCoy 2	£23
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Pro Artisan	£70	Return to Doom	£16
Render Bender	£58	Revelation	£54
Snippet	£21	Repton 3	£15
Tween	£21	Rotor	£19
GAMES		Miscellaneous	
ArcPinball	£18	Ancestry	£59
Apocalypse	£15	Arccomm 2	£38
Arcade 3 Compil.	£12	Arcterm 7	£64
Arcade Soccer	£15	Armadeus Sound	£60
Arc Pinball	£18	BBC DFS Reader	£6
Arc Trivia	£18	Broadcaster Loader	£65
Avon	£16	Equasor	£40
Ballerina	£14	FlexiFile	£98
Blowpipe	£16	Genesis	£65
Boogie Buggy	£19	Genesis 2	£113
Break 147	£20	Hearsay Comms	
Bug Hunter	£14	Pack	£50
Caverns	£14	Investigator 2	£22
Chess 3D	£14	JX Archi Colour Printer	
Chocks Away	£14	Driver for Citizen &	
Conqueror	£18	Star	£15
Cops	£14	Numerator	£66
Corruption	£18	Presenter 2	£35
Crisis	£21	Presenter Story	£145
Drop Ship	£12	Revelation	£58
Enthar Seven	£21	Rhapsody in Blue 2	£45
E-Type	£13	Speech!	£15
E-Type Designer	£13	Toolkit (Clares)	£35
E-Type Extra 100 miles	£13	Touchtype	£40
Family Favourites	£15	Tracer	£46
Fireball 2	£19		
Holed Out Designer	£13		
Holed Out Golf	£13		
Hostages	£15		
Ibix the Viking	£14		
Inertia	£13		
Inter Dictor 2	£26		
Iron Lord	£15		
Jet Fighter	£10		
Jiglet	£25		
Jigsaw	£27		
Magpie	£39		
Man at Arms	£16		
MahJong Patience	£15		

LANGUAGES (Archimedes)

ISO-PASCAL; FORTRAN 77	£77 each
Assembler; LISP; Prolog X	£149 each
ANSI C Rel. 3	£125
BASIC Compiler	£77
Cambridge Pascal	£60
Logotron Logo	£45
Macro Assembler	£40
Risc Basic	£120
Robo Logo	£69
Risc FORTH	£110

Minerva's Archimedes Software

Home Accounts*	£36	Sales Ledger*	£53
Stock Manager*	£53	Purchase	
Nominal Ledger*	£53	Ledger*	£53
Ancestry	£59	Reporter	£29
System Delta+	£55	Mailshot*	£29
System Delta + Reference Manual	£25		
Order Processing/Invoicing*	£53		
School Administrator	£118		

* Requires System Delta

NEW Business Accounts Packages
Nominal Ledger, Order Processing/Invoicing,
Purchase Ledger, Sales Ledger & Stock Control
Price: £78 per Module or
£299 for the complete Software Suite

ULTIMUM - Archimedes A3000 Podule Racking System



THE ONLY LOGICAL WAY TO EXPAND YOUR A3000 COMPUTER

The accepted standard for Archimedes computer expansion is the Acorn Podule, designed initially to fit the old 310, and also for the later A400 and A400/1 series micros. The podules fit inside these computers up to four at a time. The A3000 is the little brother of the family, but can only have one podule at a time, plugging into the back of the computer.

Other attempts have been made to expand the A3000 by trying to introduce a 'mini-podule'. This is impractical for many reasons, amongst which is the reluctance of manufacturers to produce them. Nobody wants to re-design podules already produced. Some cannot be produced on a 'mini-podule' as they are far too complicated and simply wouldn't fit.

Watford Electronics listens to the demands and requirements of its customers, and we are glad to say that we have come up with the only real solution to the A3000 expansion problem. The ULTIMUM Podule Racking System allows up to three FULL SIZE standard Archimedes 300/400 series podules to be fitted to the computer. In addition, there is also provision for a hard disc drive and a podule to be fitted internally.

Since the ULTIMUM Podule Racking System takes proper full size podules, you will be able to use any of the currently available peripheral equipment, from companies like Computer Concepts, Armadillo, Acorn and of course, our own brand. Fitting the podules to 'ULTIMUM' is simple. They are neatly fitted inside the metal case of the rack, avoiding the previously untidy method of hanging the podule off the back of the computer, risking damage to both, it and to the computer.

'ULTIMUM' has its own power supply, so no strain is put on the A3000 power supply. There is also an IEC mains output socket for an Acorn type monitor so reducing the number of plugs required to go to the mains. The ULTIMUM is rigidly clamped over the top and under the computer, and allows direct access to the floppy disc drive and reset button, rather than obstructing access as on other systems. The mounting method employed is so firm that the computer could even be safely transported without the assembly falling apart.

Price: £125

Archimedes A300/A400 SCSI Hard Disc Offer (while stocks last)

100MB Hard Disc Upgrade
complete with Controller card,
Cables, Formatter and Manuals

RRP: £999

Offer Price: £399

Archimedes to BBC Serial Link Mk 2

Using this simple data link, it is possible to solve all your BBC to Archimedes data transfer problems. The kit is supplied with a disk, and the necessary cable to connect the two computers.
New RISC OS Version

Only £15

Archimedes External Disc Drive Interface

With this interface it is possible to connect almost any 5.25"/3.5" disc drive with its own power supply to the Archimedes. Up to 4 disc drives can be connected. Fully Buffered Board. NO SOLDERING is involved. Supplied complete with necessary lead.
• A300/A3000 £21 • A400 £25

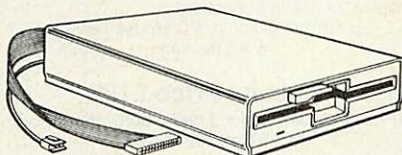
Special Education Prices

All education establishments qualify for special education prices on micros, etc. Please write in or telephone (0923) 37774 or 50335 for written quotation.

BBC MASTER

MASTER 128K Micro incl. Acorn's View, Viewsheets, ADFS, BASIC Editor & TERMINAL plus FREE OFFER (see below) £399

FREE OFFER



A 5.25" Double Sided, 40/80 track switchable 400K Disc Drive complete with cables and a Utilities disc incl. 2 games, plus

Gemini's OFFICE MATE & OFFICE MASTER packages on Disc consisting of: Database, Spreadsheet, Beebplot graphics. Accounts packs: Cashbook, Final Accounts, Mollist, Easyledger, Invoice & Statements, Stock Control.

FREE with every BBC Master purchased from us during August

ADD-ONS & ACCESSORIES

Turbo 65C102 Add-on Module	£115
Econet Module for the Master	£45
Twin ROM Cartridge for Master	£9
Quad ROM Cartridge for Master	£14
Master Reference Manual I	(No VAT) £14
Master Reference Manual II	(No VAT) £14
Master Advance Ref Manual	(No VAT) £17
64K Upgrade Kit for B+	£32
Acorn 1772 DFS Kit complete	£49
ECONET Upgrade Kit for BBC B	£42
ALL ECONET UPGRADES Available	
ARIES' IEEE Interface for BBC B & Master	£238
Morley Teletext Adaptor with ATS Rom	£99
Ecolink	£270

NEW LAUNCH for Archimedes

See Page 14 of our advert

Desk Top Publisher

Acorn's Archi DTP Package	£108
Impression 2 DTP Pack	£135
Impression Junior	£76
Tempest DTP Package	£95

Archi Wordprocessors

Pendown Archi	£48	Archie Spell Master	£25
Wordwise + Disc	£24	PD Spellchecker	£40
Image Writer	£25	View	£45
Interword Disc	£24	Graphic Writer	£19
1st Word Plus - 2	£63	EasyWord	£30

Databases

AlphaBase	£36	Multistore	£195
Knowledge Organiser	£42		

Spreadsheets

Intersheet Disc	£24	Viewsheets	£45
Sigmasheet	£39	Schema	£89

Business Graphics

GammaPlot	£39	Sigmaplot	£39
Interchart Disc	£17		

Integrated Packages

• Logistix	£79	• Pipedream 3	£119
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- Desktop Office - Database, Graphs & Charts, Wordprocessor Spreadsheet, Communications £98
- Desktop Folio - Wordprocessor, Desktop & Interactive Publishing. Ideal for school environment. £85



CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

A3000 BBC User, I/O Card, Analogue Port IIC Card

This NEW versatile I/O Card from Watford, fits inside the A3000 and includes an Analogue to Digital Converter, a User Port, and an InterIC (IIC) connector.

The card allows many of the peripherals developed for the BBC to be used with the Archimedes A3000. The ADC and User Port have the same pin out and connectors as the BBC computers.

Extensive RISC OS software is supplied to provide BBC OSBYTE calls for support of the ADC and User Ports, including the BASIC keyword ADVAL. The software provides extended RISC OS support for separate interrupts from both the ADC and User Ports, permitting easy interrupt driven operation.

The card is provided with all the software in ROM and is automatically loaded when the machine is turned on.

Peripherals connected to the ports can obtain up to 500mA of power at +5V. A fuse is fitted to the card to protect the A3000 from damage arising from accidental short circuit of the power output.

The card is provided with an extensive manual explaining installation, all software commands, connector pin outs, hardware addresses and example programs.

Features

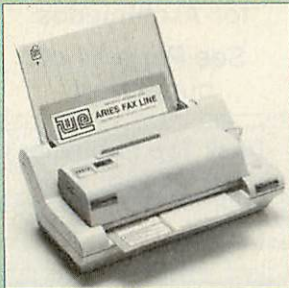
- An 8 bit User Port with a standard 20 way IDC connector, compatible with the User Port on the BBC computers and the Archimedes I/O Podule.
- A 10 bit Analogue to Digital Converter with a standard 15 way D type connector, compatible with the ADC on the BBC range of computers and the Archimedes I/O podule.
- An InterIC (IIC) Port with a 5 pin DIN socket to connect the A3000 to external IIC devices.

£42

Call or write in for our NEW 100 page Summer Catalogue

Continued → → → → → → → → →

Archi A4 Scanner



This new A4 image scanner from Watford Electronics is supplied complete with ROM based podule software. Features provided include facilities for zooming in on an image and inverting the image in X and Y directions, saving and printing of the sprite created. Interactive help is supplied using the IHELP application on the Acorn applications discs.

The 216mm scanning width can cope with both desktop scanning of single sheets, photographs, diagrams, etc., with its fast ten page automatic document feeder, but it can also detach from the feeder to become a convenient hand-held full page scanner for larger documents or pictures.

Scanned image control can be freely adjusted in increments of 10 dots per inch from 100 up to 400 dpi resolution with 64 levels of grey scaling. A built in shading controller and manual brightness control achieve optimum image clarity.

Unlike some scanners, which use a red light source, the Watford scanner uses a yellow/green source which vastly improves the light/dark contrast, thus eliminating the effect where any red-based colours are faded down to white and so do not show up in the scanned image.

All these features and facilities combine to make the Archi Page Scanner the fast and convenient way in which to add that extra impact, interest and clarity to documents, reports, instruction sheets, manuals, news letters, etc., from your Archimedes DTP package.

Introductory Prices:

Archi A4 Scanner	£349
Sheet Feeder for above	£95
Scanner + Sheet Feeder	£419

Z88 Portable Micro



£185

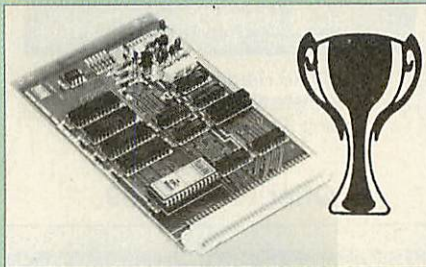
FREE

With every Z88 purchased from us, we are giving away absolutely FREE, a Z88 to BBC Interface Link, 4 rechargeable batteries and a compact Mains Battery Charger worth £38.

Z88 ACCESSORIES

• 32K RAM Pack or 32K EPROM Pack	£18.00
• 128K RAM Pack or 128K EPROM Pack	£42
• 512K RAM Pack	£175
• Z88 Eprom Eraser Unit	£33
• Z88 Spellmaster for Pipedream	£45
• Z88 Carrying Case	£8
• Z88 Computing Book	£9.95
• AA Nicad Rechargeable Battery	£1.50
• Battery Charger Compact & Fast	£6
• Z88 Serial Printer Cable	£8
• Z88 Parallel Printer Cable	£25
• Z88 to Archi Link	£15
• Z88 to BBC Link	£20
• Z88 to PC Link II	£30
• Z88 to Macintosh	£52
• Z88 Mains Adaptor	£9
• Z BASE	£56
• Z TAPE	£42
• Z TERM	£42
• Z88 Modem	£149

Archi Real-Time Digitiser



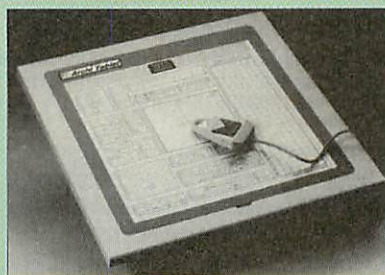
Now supplied with NEW RISC OS Version Software

Watfords' Archimedes Video Digitiser is the most sophisticated digitiser ever designed for a micro. It provides a fast and flexible means of capturing images from a video camera or recorder for display and manipulation on the Archimedes range of Micros. Off-air television signals may also be digitised via a video recorder or TV tuner. Please write for further details.

Price £175

A Set of Colour Filters for colour image grabbing using a video camera	£16
New Risc-OS Software Upgrade	£39

Archi Graphic Tablet



The Archi Graphic Tablet offers performance and accuracy comparable to other tablets priced at well over £400, and has the useful addition of a liftable cover, which can hold tracing material or menu templates securely. The package is supplied complete with sophisticated Archi software. (Now, fully LinCAD compatible. Recommended by Linear Graphic for use in Education).

(FREE this month, PC Mouse Drivers & Art package)

Special Price £199

(Price includes Tablet, Leads, Software & Puck)
Stylus Optional Extra £15

Archi Graphic Tablet Junior. Working area 9" x 6". Price includes Stylus £125

Disc Plonker Rack

When using ones micro, there is a tendency to have more than one Disc on the desk. This exposes them to the hazards of fingerprints, scratches, dust, coffee and an untidy desk. Why not protect your valuable data from all these hazards with the help of our extremely handy and low cost DISC PLONKER RACK. Holds up to eight 5.25" discs.

Protection at Only: £2



Acorn & Watford DFSs

• Watford sophisticated DFS ROM	£16.00
• Watford DFS Kit complete	£69.00
• We will exchange your existing ROM for Watford's ultimate DFS ROM at only	£12.00
• DFS Manual (comprehensive)	£6.95
• Acorn DNFS ROM	£17.00
• Acorn ADFS ROM only	£25.00
• Acorn 1772 DFS ROM Kit	£49.00

(The single Density DFS system is now old technology. Like Acorn, Watford too have decided to replace it with the their more up-to-date 1770 DDFS interface. We have informed most of the software houses of this decision in order that they can ensure compatibility with our highly sophisticated and fully Acorn compatible DDFS).

Watford's MkII 1772

Single/Double Density DFS

Many of our customers have wanted to use our superior DDFS and Acorn ADFS together. Now our Mk II DDFS Board with its 1770 Disc Controller, has been adapted to allow the use of Acorn ADFS as well. It also has all the commands of the Acorn's 1770 DFS, plus the added features.

Added features include:

- Acorn ADFS compatible – Use ADFS on our DDFS board.
- Tube host Code – No longer any need to have the DNFS in your machine to use Co-Processors, even the CoPro and Master 512.
- Auto 40-80 Track sensing – no need to fuss with 40/80 track switches (even works with protected disks).
- An extremely powerful 8271 emulation – ensuring compatibility with almost all software.
- New low profile – small footprint board.
- Fits with all third party ROM boards.
- Option to double the speed of file handling operations – BPUT and BGET.
- Operates in both single and double density modes.
- OSGBPB has been recoded, increasing still further the speed of file handling.

Please note that not all DDFS's are capable of providing either the full 80% storage increase or of allowing a file the full size of the disk – Ours allows both of these!

If you already have a DDFS (any manufacturer), and wish to upgrade to our MkII version, then simply return your existing ROM and DDFS board and we will supply the new DDFS for only £39.00.

• SPECIAL PRICE	£44.00
• DDFS Manual	(No VAT) £6.95
• We will exchange your existing DFS Kit for our sophisticated DDFS for only	£30.00

Please note, as the MkII DDFS is a hardware and software upgrade, it is not possible for existing Watford DDFS users to simply exchange the ROM for the new version.

3M – Diskettes

3M – SCOTCH Diskettes with Lifetime warranty from Watford Electronics your 3M Appointed Distributor

• 10 x 5.25" S/S D/D 40T (744)	£5
• 10 x 5.25" D/S D/D 40T (745)	£5
• 10 x 5.25" S/S D/D 80 Track (746)	£7
• 10 x 5.25" D/S D/D 80 Track (747)	£7
• 10 x 5.25" 1.6M D/S D/D High Density for IBM XT and AT	£9
• 10 x 3.5" S/S D/D 40/80 Track	£7
• 10 x 3.5" D/S D/D 40/80 Track	£7
• 10 x 3.5" Double Sided High Density	£13

Top Quality 3.5" & 5.25" Diskettes

To complement our range of Quality Discs and Disc Drives. WE are now supplying SPECIAL OFFER packs of 10 Lifetime guaranteed discs. Each disc has a reinforced hub ring. Supplied complete with selfstick labels and a Plastic Library Disc Box.

• 10 x M3 3.5" D/S D/D 80 Track	£7
• 10 x M9 3.5" D/S High Density	£12
• 10 x M4 5.25" S/S D/D 40 Track	£5
• 10 x M5 5.25" D/S D/D 40 Track	£5
• 10 x M7 5.25" D/S D/D 80 Track	£7
• 10 x M8 5.25" D/S H/D Hi-Density	£9
• M2 3" Double Sided	£2.50 each



CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

Quality Disc Drives from Watford

All our Disc Drives are Double Sided and will operate in both Single and Double Density modes. All 5.25" Disc Drives are 40/80 track switchable. For ease of use, the switches are front mounted. Various UK "manufacturers" of disc drives for the BBC micro (more accurately, "packagers" label other manufacturers drives with their own name). We buy the high quality NEC and Mitsubishi drives in large quantities directly from the manufacturers, package them and sell them at "dealer" prices direct to the public.

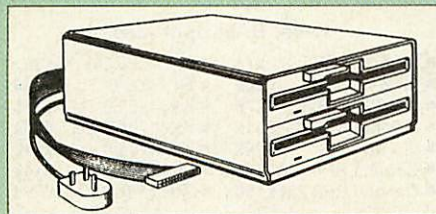
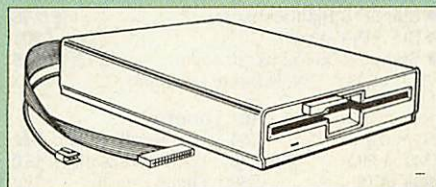
If you look around the popular BBC Micro press, you will find that the prices we quote for the top quality, new slimline disc drives are, virtually without exception, the best around. These prices, coupled with the backup of one of the country's largest distributors of BBC peripherals provides a superb deal.

Unless you anticipate using dual drives in a fully expanded BBC system for long periods of time with little ventilation, then we suggest that our range of "CL" disc drives without the PSU (Power Supply Unit) would be quite adequate (extensive tests within our workshops have confirmed this). All drives are supplied complete with a SPECIAL UTILITIES Disc, Cables and Plugs. The Drives with power supply have a mains moulded plug for safety purposes. **Ideal for Schools & Colleges.**

When using a BBC Micro, most people find themselves short of desk space. The Watford's BBC Micro plinths form an ideal way of recovering some of this precious space. Your BBC Disc Drive and Monitor can all occupy the same vertical footprint and still be comfortably situated. With the Watford Double Plinth, your Disc Drive is mounted vertically at one side, leaving a very valuable area directly in front of you for such useful items as spare discs, pen, paper, reference manuals, etc. Follow the trend with a Watford plinth. (Turn to the 6th page of our advert for the Plinths).

P.S. All our 5.25" Disc Drives with PSU are compatible with the Compact Micro. All you require is our special Compact Disc Drive cables designed by us.

"Test Bureau Approved for Use in Education"

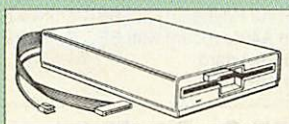


Our Disc Drives conform to BS415

Type	Description	
Disc Drive without PSU		
• CLS400S:	Single, 40/80 track 400K Double sided Drive	£72
• CLD800S:	Twin, 40/80 track, 800K Double sided Drives	£142
Disc Drive with PSU		
• CS400S:	Single, 40/80 track, 400K Double sided Drive	£82
• CD800S:	Twin, 40/80 track, 800K Double sided Drives	£155

Special Cable to connect both 3.5" and 5.25" Disc Drives simultaneously to the BBC Compact £13

Disc Drive/DDFS Offer



- The popular CLS400S 40/80 track switchable disc drive.
 - Watford's popular Mk II DDFS Interface (allows up to 720K storage). Will run both in single & double density modes.
 - A comprehensive DFS Operating manual
- Bargain at Only £116** (Offer valid until stocks last)

3.5" DISC DRIVE

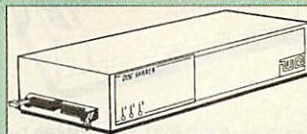


These top quality 3.5" Double sided, 80 track, are attractively finished in BBC beige. They are supplied complete with all cables and a Utilities Disc.

Type	Description	
Disc Drive without PSU		
• CLS35:	Single Disc Drive, 400K	£62
• CLD400S:	Twin Disc Drives, 800K	£109
Disc Drive with PSU		
• CS35:	Single Disc Drive, 400K	£83
• CD35:	Twin Disc Drives, 800K	£126

(P.S. CS35 is supplied in a twin case with a blanking plate to enable easy expansion to a dual drive at a later stage)

Disc Drive Sharer

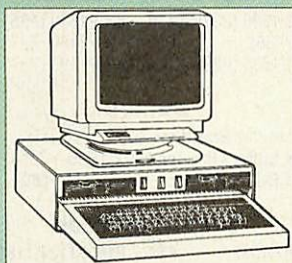


(Ideal for educational establishments)

A low cost alternative to the Econet system. Watford's Intelligent Disc Drive Sharer allows you to connect 3 BBC micros (model B, B+ and Master series) to a single or double disc drive. Running under any DFS or DDFS, this intelligent unit will automatically queue the computers. Each computer has a status light dedicated to it. If it is green you will get immediate access to the disk, and red means that you are next in line. The unit plugs directly into the disc drive socket on each computer and is powered by the mains. (N.B. Not for use with ADFS.)

Price includes 3 Cables **£55**

Disc Drives in Monitor Stand



• **CDPM 800S** – Twin 5.25", 800K Double sided 40-80 track switchable disc drives mounted in an attractively finished Beige colour plinth for the BBC B & Master 128K micros. Supplied complete with integral power supply, cables and Utilities disc. The mains switch with neon On/Off light indicator, and the two 40/80 track switches are mounted on the front panel for ease of use.

£165

• **DP35 800** – Same as above except, one disc drive is a 5.25" and the other is 3.5".

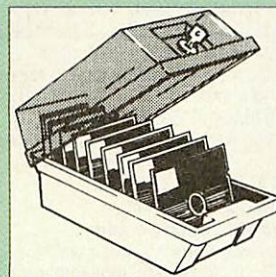
£154

Floppy Head Cleaner Kit

The heads in floppy drives are precision made and very sensitive to dirt. The use of Cleaner Kit is a sensible precaution against losing valuable data. It is recommended to clean the drive head once a week. It is very simple to use. Available in 3.5" & 5.25", please specify.

Price £4

Antistatic Lockable Disc Storage Units

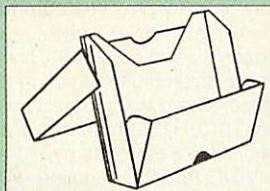


Gives double protection – Strong plastic case that affords real protection to your discs. Antistatic helps avoid data corruption whilst in storage. The smoked top locks down. Dividers and adhesive title strips are supplied for efficient filing of discs.

• M35 – holds up to 50 5.25" discs	£4.95
• M85 – holds up to 95 5.25" discs	£6.95
• M25* – holds up to 25 3.5" discs	£4.95
• M50 – holds 50 3.5" discs	£6.50
• M10 – holds 8 of No. 10 Data Cartridges	£15

* Not lockable

Plastic Library Cases



Holds up to 10 x 3.5" Discs.	£1.50
Holds up to 10 x 5.25" Discs.	£2.00

Dust Covers (For our Disc Drives)

Single CLS (without PSU)	£3.20
Single CS (with PSU)	£3.25
Twin CLD (without PSU)	£3.85
Twin CD (with PSU)	£3.90

Disc Albums

Attractively finished in black leather-look vinyl. Stores up to 20 discs. Each disc can be seen through the clear view pocket.

£4

Special Bulk Offer on Discs

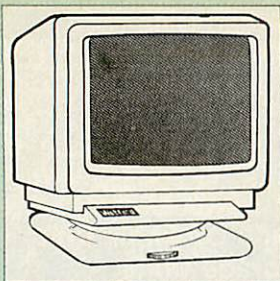
(Supplied packed in Anti-Static Lockable Storage Units)
(Lifetime warranty on Discs)



BULK PACK DISCS in lots of 100

Type	S-S 40T	D-S 40T	D-S 80T
• Without Sleeves 5.25"	£30	£35	£40
• With Sleeves 5.25"	£33	£38	£43
• 3.5" D/S D/D	£29 for 50		£52 for 100

Continued → → → → → → → → →



12 months
FREE
maintenance
on site

Microvitec Monitors

- 1431 - Standard Resolution Monitor £169
- 1451 - Medium resolution, suitable for word processing in mode 0 £209
- Cub3000 Medium Res for A3000 £189
- 1441 - High res, exceeds the capabilities of the BBC Micro £359
- 2040 CS 20" Hi Res £675
- Dust Cover for Microvitecs £5.50
- Touchtec 501 Touch Screen £239

Now 3 years Parts & Labour warranty on all Microvitec Monitors

Multiscan Colour

- Eizo 9060S £389 • NEC 5D £1299
- Eizo 9070S £579 • Taxan 770LR £379
- NEC 2A £255 • Taxan 775 £375
- NEC 3D £345 • Taxan 795-PC £425
- NEC 4D £679 • Taxan 875 £725
- VIDC Enhancer Board £25

(P.S. Taxan 795 monitor is supplied with a FREE VIDC enhancer board)

Aries AlphaScan Monitor

Pound for Pound, the AlphaScan VGA Multiscan monitor provides the maximum performance and greatest flexibility of any 14" colour monitor.

Its multiscan circuitry provides automatic adjustment for frequencies between 30 and 60KHz horizontal, and 50 and 90Hz vertical. Its 0.28mm dot pitch high resolution tube provides super sharp text graphics, while a high speed (70/72Hz) refresh rate provides a flicker-free display easing the eye strain. The Multivideo VIDC Adaptor supplied (free) with the monitor allows high resolution operation in all screen modes.

£325

Philips Monitors

- BM7502 12" Hi-res Green Monitor £70
- BM7522 12" Hi-res Amber Monitor £67
- CM8833 14" Med. Res Colour Monitor £178
- TV Tuner for CM8833 Monitors £62
- Dust Cover for Philips Monitors £6

(Securicor carriage on Monitors £7)

Spare Monitor Leads

- BNC Lead for Zenith or Philips £3
- Skart Monitor Lead £5
- RGB lead for TAXAN Monitors £3
- Archimedes Colour Monitor Lead £7.50

Anti Glare VDU Screen

These extremely effective, easy to install, 12" & 14" VDU screens eliminate harmful glare, improves contrast on colour monitors. Increases productivity in offices. A must for wordprocessor users.

£12

Canon Bubblejet Printers

- | Printer | CSF | D'ble Bin | Ink Cart |
|---------|------|-----------|----------|
| BJ10E | £205 | £54 | £18 |
| BJ300 | £354 | £88 | £12 |
| BJ330 | £399 | £110 | £12 |
- Spare Battery pack for BJ10E £33

NEC Pinwriter Printers

- P20 £186 • P70 £475
- P30 £250 • P90 £655
- P60 £374

Concept Keyboards

- Standard A3 Keyboard with BBC Software £143
- Standard A4 Keyboard with BBC Software £117
- Archi A3 Keyboard £144
- Archi A4 Keyboard £118

FREE On-Site Maintenance

This month we are also offering at no extra cost to all our customers, 12 months, On-Site Maintenance on all Multiscan colour monitors, all Panasonic printers, and all Laserjet Printers, Roland Plotters and of course the full range of Archimedes micros. Should the machine fail, simply telephone the maintenance engineer, who will call in within 12 working hours. (Offer applicable only when bought at prices advertised in this advert. UK mainland only).

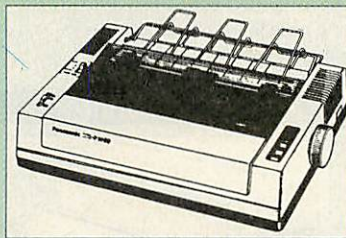
Hewlett-Packard Printers

- # Desk Jet 500 £299 • Paintjet XL £1092
- Desk Writer (Mac) £482 • Quiet Jet Plus £359
- Desk Jet Cartridge £15 • HP Think Jet £239
- Paint Jet Colour £589 • Rugged Writer £839

Now 3 years extended Parts & Labour warranty

- Paintjet Cartridges Black £19; Colour £25
- Desk Jet 500 256K RAM cartridge £129
- HP Epson FX Emulation Cartridge for Desk Jet £59
- HP Apple Talk Interfaces for £299 • Paint Jet £299
- Scan Jet £299 • Desk Jet Unlimited (Book No VAT) £19.75

Panasonic Printers



FREE with every KX-P1081 & KX-P1180 Printers: A printer lead (please specify type required) and a Dump Out 3 ROM for the BBC Micro or 1,000 sheets of paper for other micros (please specify)

- KX-P1081 9pin 80col. 144/28 cps £116
- KX-P1180 9pin 80col. 192/38 cps £119
- KX-P1123 24pin 80col. 192/63 CPS £158
- KX-P1124 24pin 80col. 192/63 CPS £215
- KX-P1624 24pin 132col. 192/63 CPS £299
- KX-P1695 9pin 132col. 330/86 CPS £299
- KX-P1654 24pin 132col. £429

Above prices include FREE, Watford's 12 months on-site maintenance

Panasonic Accessories

Cut Sheet Feeders

- KX-P1592/1595 (P32) £175 KX-P1540 (P35) £175
- KX-1124 (P36) £79 KX-P1180 (P37) £70
- KX-P1624/1695 (P38) £124 KX-P1123 (P37) £70

Buffers

- P12 4K buffer Board for 1081 £55
- P42 32K buffer Chip for 1592/1595 £16
- P43 32K Buffer Chip for 1540/1124/1180 £16

Serial Interfaces

- P17 P1081/1592 £32 P19 P1124/1180 £49

Citizen Printers

- 120D Plus £96 124D Printer £138
 - Produt 9 £205 Produt 24 £225
 - Produt 9X £245 Swift 24# £205
 - Swift 9 £138 Swift 24X £279
 - Produt Cut Sheet Feeder £120
 - Swift 24 Colour Option £29
 - Swift 24 Ribbons Black £4 Colour £13
- # Special Offer this month - A FREE Colour option cartridge with every Swift 24 printer purchased from us.

Star Printers

- LC10 9pin 80col. 144/36 CPS £112
- LC15 9pin 136col. 180/45 CPS £180
- LC24-10 24pin 80col. 180/60 CPS £150
- LC24-15 24pin 136col. 200/67 CPS £295
- *FR10 9pin 300/76 CPS 31K 16 fonts £229
- FR15 Wide carriage version of above £290
- *XB24-10 24pin 80col. 240/80 CPS £299
- XB24-15 24pin 80col. 240/80 CPS £365
- XB-24 Colour Kit £29
- LC-200 Colour 9pin 80col. 180/45 CPS £158
- LC-24-200 24pin 80col. 222/67 CPS £189
- LC24-200 Colour 24pin 80col. 222/67 CPS £222

*FREE Colour Ribbon with these printers

Star Accessories

Cut Sheet Feeder

- LC10/200/24-10 £65 LC15/LC24-15 £125
- XB24-10 £80 XB24-15 £139

Serial Interfaces

- SPC-10 LC10; LC10-II; LC10-Col; LC15; LC24-10; LC24-15; LC-200; LC24-200 £49
- 8K Ser LC-200; LC24-200; FR10; FR15; XB24-10; XB24-15 £64

Paper Roll Holders

- LC-200; LC24-200; LC24-200 colour £29

Buffers

- 32K Ram Card for LC/XB24-10; 15; LC200 £55

Ribbons

- LC10; LC10-II; LC15 Black £4; Colour £6
- LC-200; LC24-200 Black £5; Colour £12
- XB24-10; XB24-15 Black £5; Colour £12

Laser Printers

- Canon LBP-4 4ppm £655
- Canon LBP-8 IIIR 8ppm £1505
- Canon LBP-8 IIIT 8ppm £1389
- Epson EPL7100 6ppm £689
- HP Laserjet III 8ppm £1025
- HP Laserjet IIID 8ppm £1819
- HP Laserjet IIIP 8ppm £729
- HP Laserjet IIISI 16ppm £2599
- Panasonic KX-P4420 8ppm* £648
- Panasonic KX-P4450* 11ppm* £1025
- Panasonic KX-4455 Postscript 11ppm* £1699
- Qume Crystal Print Publisher 2 £1899
- Star LP-8 III £979
- Star LP-8 Star(post)script £1195
- Star LP-4 4ppm £705
- Star LP-4PS Postscript 4ppm £875

* Now 2 years warranty

Laser Toners

- Canon 2 & 4 £54 Laserjet IIP & IIIP £55
- Epson GQ £18 Laserjet II/D, III/D £70
- Star LP-8 £69 Qume Crystal £56
- KX-P4420/50 £22

Laser RAM Upgrades

- IIP & III 1MB £74 • EPL7000 2M £365
- IIP & III 2MB £109 • GQ5000 512K £95
- II & IID 1MB £76 • KX4420/50 1M £115
- II & IID 2MB £112 • KX4420/50 2M £159
- II & IID 4MB £299 • KX4420/50 4M £349
- Canon LBP4 1M £175 • Star LP8 1M £143
- Canon LBP8 2M £150 • Star LP8 2M £285

Laser Drum & Developer

- Epson Drum GQ5000 £93 EPL7100 £129
- Panasonic 4420 Drum £60 Developer £59
- Panasonic 4450 Drum £93 Developer £80
- Qume Drum £76 Developer £56

Jetpage Postscript Cartridge

- HP IIP/III £255 IID & IIID £265

NEW - HP Laserjet

- Various Font Cartridges £45
- Superset Font £195

Integrex Colour Jet

- Colour Jet 132 Printer £515
- Paper Roll £6.50
- BBC Screen Dump Software £10
- Colour Cartridge £19.50
- Black Cartridge £11.25
- 100 A4 OHP transparencies £55
- 8K Serial Interface Optional £123

INCREDIBLE INKJET PRINTERS OFFER

Laser print quality at dot-matrix prices

HP Deskjet 500 Printer	£299
Canon BJ10E Printer	£199
(Offer Valid while the present stocks last)	

Epson Printers

DFX5000	£1089	LQ860 Colour	£465
DFX8000	£1999	LQ1050+	£475
EX1000	£456	LQ1060	£599
FX850	£283	LQ2550+	£709
FX1050	£358	LX400	£109
FX1060	£599	LX850	£150
LQ400	£166	SQ850	£439
LQ550	£209	SQ2550	£645
LQ850+	£385		

Cut Sheet Feeders for

LX400/800/850/LQ400/500/550	£69
EX800/FX800/850/LQ800/850	£130
FX/LQ 1000/1050/SQ850	£159
LQ 2550	£390
SQ2550	£390

Tractor Feed for

LQ800 £44; LQ850/FX850 £69; LQ1050/
FX1050 £85; LQ2500 £90; LQ2550 £90.

Accessories

• EX800/1000 Colour Option	£45
• EX800/1000 Colour Ribbon	£14
• LQ2500 Colour Option	£65
• Multifont Card for LQ550/850/1050	£95

Epson Printer Interfaces

All these interfaces fit inside the printer

RS232	£32	RS232 + 2K Buffer	£52
IEEE 488	£95	RS232 + 8K Buffer	£75

Printer Leads

BBC Centronics 4' long	£5
BBC Centronics 6' extra long	£7
Compact's Special Centronics Lead	£7
Archimedes Printer Lead 6'	£6
Nimbus Centronics Lead	£6
IBM/Archimedes Parallel Lead 6'	£6
IBM/Archimedes Parallel Lead 5 metres	£13
IBM/Archimedes Parallel Lead 10 metres	£19
Double Ended 36 way Centronics Lead 4'	£7
Double Ended 36 way Centronics Lead 6'	£9
MSX Centronics Parallel Lead 4'	£12
RS232 Leads (Various)	P.O.A.
IBM Keyboard extension lead coiled	£5

Plotters

• HP7440	£425	• HP7475	£599
Roland Plotters			
• DXY1100	£515	• DXY1200	£645
• DXY1300	£845	• DXY2500	£2375
• DPX3500	£3289	• Sketchmate	£333
• Roland plotter Pens, Fibre tip			£7.50

Watford VIDC Enhancer

This unique VIDC add-on board for the Archimedes, caters for all types of Multiscan and VGA monitor and mode requirements. There are 2 versions to suit all requirements. The multimode software supplied, provides all the new modes for the selected monitor type, including the now standard Computer Concepts modes. With VGA monitor, you are no longer restricted to a few modes. A WIMP application supplied on disc, allows new modes to be designed and existing modes to be modified for particular monitors.

Super VGA VIDC Card: This provides support for both VGA and Multisync monitors. A unique electronic design allows the horizontal and vertical sync to be buffered and have the polarity changed under software control

£45

MultiVideo VIDC Card: As above but for MultiScan monitors only.

£25

Listing Paper (Perforated)

• 1,000 Sheets 9.5" x 11" Fanfold Paper	£7
• 2,000 Sheets 9.5" x 11" Fanfold Paper	£11
• 1,000 Sheets 9.5" x 11" NCR 2 Part Fanfold	£21
• 1,000 Sheets 15" x 11" Fanfold Paper	£9
• 2,000 Sheets 15" x 11" Fanfold Paper	£16
• 1,000 Sheets true A4 Fanfold Paper 70gms	£11
• 2,000 Sheets true A4 Fanfold Paper 70gms	£21
• Teleprinter Roll (Econo paper)	£4

(All our Fanfold paper is Micro perforated leaving a smooth clean edge when the tractor feed strips are detached).

Carriage 1K Sheets £2.50, 2K Sheets £3.00

Printer Labels

(On continuous fanfold backing sheet)

1,000 90 x 36mm (Single Row)	£6.00
1,000 90 x 36mm (Twin Row)	£6.25
1,000 90 x 49mm (Twin Row)	£7.50
1,000 102 x 36mm (Twin Row)	£6.75

Special Offer

Hitachi/Acorn 12" High Resolution, ergonomically designed Colour Monitors. Supplied complete with a swivel base and a BBC lead.

Only: £145 (While stocks last)

Printer Ribbons & Various Dust Covers

Type	Ribbons	Dust Covers
Brother HR15/20	£6.00	—
BBC Micro	—	£3.50
BBC Master	—	£4.00
Archimedes Micro pair	—	£9.00
Citizen 120D	£2.75	£4.50
DMP2000	£2.75	£4.75
EX800/1000	£3.50	£5.00
RX/FX80/85/800/MX80	£2.95	—
FX/MX/RX100/1000	£3.95	—
Kaga/Taxan KP810/815	£3.25	£5.00
LQ400/500/550/800/850	£3.25	£6.00
LQ1050/LQ2500	£4.00	—
LX80/86/800/850	£2.75	£4.50
LX400	£3.50	£5.00
M1009/GLP	£2.95	£3.75
NEC P2200	£4.50	£5.00
Panasonic KX1080/81	£3.25	£4.75
Panasonic KX-P1124	£7.50	£5.00
SQ2500	£23.00	£5.50
Star LC10/NL10	£2.75	£5.00
Star LC24-10	£2.95	£6.00
Olivetti Ink Jet Cartridges (set of 4)	£9	

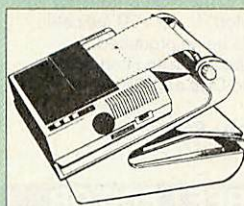
Our attractive Dust Covers are manufactured from translucent PCV. The seams are stitched and edges are taped to prevent splitting due to continuous use.

Original Panasonic Ribbons

Guaranteed to last 3 million characters

P110 for KX-P1081, 1592 & 1595	£6
P115 for KX-P1180	£7
P145 for KX-P1124	£7
P140 for KX-P1540	£8
P155 for KX-P1624	£8
Colour Ribbons for KX-P1081, 1592 & 1595	
Brown, Blue or Red	£9 each

Professional Printer Stand



effectively halved. Its ergonomic design ensures smooth paper flow and automatic refolding.

80 Column version £24 (carr. £3)

132 Column version £29 (carr. £4)

Universal Printer Sharers/Changer

Connect up to 5 Micros to 1 printer or 5 Printers to 1 Micro with our combined, Sharer/Changer. These Units are made to a very high standard. For extreme reliability, they all have Printed Circuit Boards mounted inside the case, (not a Spaghetti Junction of wires). Internal connection is made via high quality ribbon cables.

(Ideal for School environments)

Connects	Serial	Centronics
2 to 1	£16	£17
3 to 1	£22	£24
5 to 1	£32	£36

(Cables extra at £6 each. Please specify type required when ordering)

2 Way Compact Printer Switch

A handy 2 way printer switch. Enables one micro to be connected to 2 printers or vice versa.

Centronics £18; Serial £17
(Cables extra at £6 each)

Auto Printer Sharer Switch

Connects	Serial	Centronics
2 to 1	£40	£45
4 to 1	£62	£59
8 to 1	—	£89

256k Multi Spooler

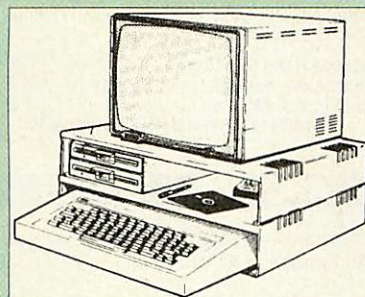
These Auto Centronics Printer Sharers have built-in 256K of Printer Buffers. They can be used as Auto Sharers, Printer Buffers or both.

• 2 In/2 out	£135	• 4 In/2 out	£169
• 8 In/1 out	£199		

Compact Converter Units

Serial to Parallel	£36	Parallel to Serial	£37
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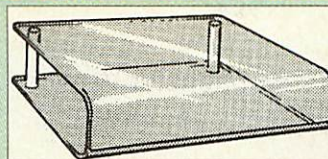
Plinths for the BBC B & Master 128K Micros



Protect your computer from the heat of your VDU. Our micro plinths have slots for maximum ventilation. The single plinth is suitable for a BBC and VDU, whilst the double height version provides enough room for our stacked disc drive and other peripherals like, Eprom programmer, music unit or simply discs & stationery. The computer slides neatly in the lower section allowing easy access to remove the lid. Colour: Matching BBC Beige.

Single BBC Plinth	420 x 310 x 105mm	£13
Double BBC Plinth	420 x 310 x 210mm	£24
Single Master Plinth	490 x 310 x 105mm	£14
Double Master Plinth	490 x 310 x 210mm	£26
(Carr. Single plinth £2; double plinth £3)		

Perspex Printer Stand



Give your Computer System a touch of Class with our elegant, smoke finished Perspex Printer stand.

80 Column version	£16 (carr £3)
136 Column version	£20 (carr £4)

Continued → → → → → → → → →

QUEST MOUSE Mk III



- Quest Mouse III & Quest Paint £59
 - Quest Mouse III, Quest Paint, AMX Stop Press & Pagefont £89
 - Quest Mouse III only £30
 - Quest Paint Software only £34
 - Quest Font Disc (22 Text Fonts) £15
 - Quest Mouse Mat (Red or Blue or Green please specify) £3
 - Quest Colour Dump Disc – This new software allows you to print direct from Quest Paint to your Integrex Colour Printer £18
- (P.S. Quest Paint is not compatible with BBC Compact)

Quest Paint is the winner of the BBC Acorn User 1990 Award for the Best Art/Graphics software

ConQuest

Quest combined with ConQuest and Acornsoft GXR ROM make up THE MOST POWERFUL drawing packages available for the BBC range. Quest Paint is able to take advantage of almost any additions to your machine, such as Shadow or Sideways RAM. ConQuest takes this principal even further, by utilising the otherwise normally incompatible Sideways RAM facility by holding pictures in them.

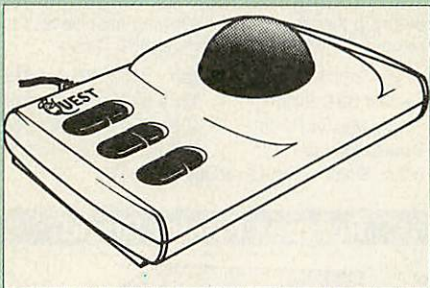
ConQuest ROM Package £30
(Price includes software in ROM and a comprehensive Manual).
(Not Compatible with BBC Compact)

ARCHI Mk II MOUSE

An extremely reliable replacement mouse for Archimedes Micro £32

Quest – Tracer ball

An attractively finished, extremely reliable, mouse replacement, input device. Requires very little desk space. Connects directly to your BBC B, BBC Master or Archimedes Micro.



QT-10 BBC/Master Version £27

QT-20 Archimedes Version £30

RB2 Marconi TRACKER BALL

RB2 (AMX/Quest compatible) £45
RB2 including Quest Paint £75
RB2-A for Archimedes £46

THE NEW Mk III AMX MOUSE

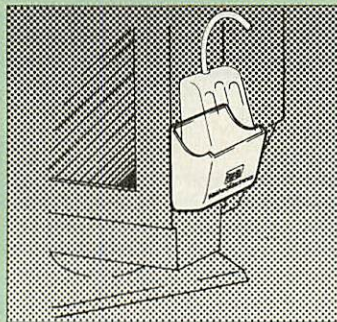
Inc. Super Art package

ONLY: £59 (carr £3)

(Please specify for BBC, Master or Compact)

- MOUSE MAT £3
- AMX MOUSE ONLY £29
- AMX SUPERART Package £34
- AMX STOP PRESS – A Desktop publishing software. Works with Keyboard, Joystick or a mouse £32
- PAGE-FONTS – Over 20 Fonts for use with AMX Pagemaker £13
- AMX DESIGN (ROM) £55
- AMX XAM Educational £15
- AMX EXTRA EXTRA £16
- AMX MAX A gem of desktop (ROM) £20

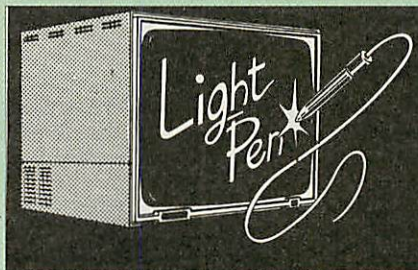
WE Mouse House



Treat your mouse to a cosy Mouse House. This handy little gadget solves the problem of where to store your mouse when it is having a rest. Made of sturdy plastic, the WE Mouse House attaches to the side of your computer, monitor, disc drive or desk.

It protects it from damage when not in use, yet within easy reach when you need it again. At £4 it does not cost a rodent's ransom.

Price £4



Our Mark II Light Pen is the very latest in light pen technology. It is totally insensitive to local lighting conditions and works with many different monitors. The pen only responds to the High Frequency light produced by your monitor/TV. An LED indicates when valid video data is being produced. A conveniently located switch is also fitted. (Price includes FREE software Disc and Operating Manual)

Only £21

FLEET STREET EDITOR

- Software pack for BBC Micro £33
- Software pack for the Master £39
- Admin Xtra Disc Utility £13
- Fonts N Graphics Disc Utility £13

BEEB VIDEO DIGITISER



"Test Bureau Approved for Use in Education"

Using any source of composite video (colour or monochrome) and the Watford Beeb Video Digitiser, you can convert an image from your camera into a graphics screen on the BBC Micro. This uses the full graphics capacity of the BBC micro in modes 0, 1 or 2. The video source may be a camera, video recorder or television, and is connected via the video output socket. The software supplied includes a sophisticated, fast screen dump routine.

Images produced can be compressed, stored to disc, printed on an Epson compatible printer, directly used to generate graphics, analysed for scientific and educational use or converted to other formats e.g. Slow Scan TV or receiving a picture from a remote camera using a modem. The output from the digitiser exactly matches the graphics capability in each mode, with up to 8 levels of grey in mode 2. The unit connects into the User Port and automatically scans a complete picture in 1.6 seconds.

£109 (Carr. £5)

(BBC B+ and Master compatible, except Master with Econet)

(Price includes) Digitiser Unit, Software in ROM & a Comprehensive Manual)

The Beeb HandScan

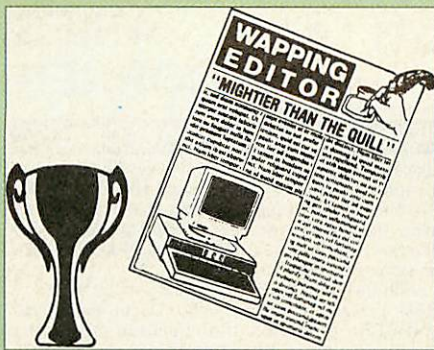
Hand-held Scanner for the BBC Micro



Watford Electronics are pleased to announce the launch of the first hand held scanner for the BBC Micro. HandScan is a compact unit which will allow photographs, diagrams, or any other documents to be digitised quickly and easily, to then be used in a desk top publishing package, art program, or even in your own Basic programs! These useful devices have been available for faster and more expensive micros for some time, but only now is Watford Electronics able to offer the BBC Micro computer. The HandScan plugs directly into the 1MHz bus on the BBC while a comprehensive set of utilities provided by the sophisticated ROM firmware. The scanner has a resolution of either 100 DPI or 200 DPI when accuracy is essential. Pictures as wide as 4" may be scanned in mode 0 and various types of dithering may be selected to simulate the grey levels of a scanned picture.

All necessary software has been included in the firmware to allow the scanner to read images directly into our Wapping Editor with little more than the click of the mouse. The digitised picture may then be incorporated into your magazine, newsletter, report or any other document.

Beeb HandScan & Firmware £135



Winner of the BBC Acorn User 1990
Award for the Best DTP/Word Processor

The Wapping Editor

The Wapping Editor from Watford Electronics represents a breakthrough in Desktop Publishing for the Beeb. The package includes a 64K ROM containing ALL the software needed to get into print fast; a very sophisticated graphics module, professional quality typesetting software, a word processor, a comprehensive font editor for designing your own typefaces, and a variety of printer dumps. This mouse-driven system is designed for the BBC B, the B+ and Master computers and will take full advantage of any Sideways and Shadow RAM that may be fitted. It will run under DFS, ADFS and Network filing systems and requires as a minimum just a single 40 track drive.

Included with the system is a utility disc containing several high quality fonts, various utilities and a ROM image of a Support ROM. A comprehensive 100 page manual completes the package. The Support ROM contains routines to allow an area to be rotated to any angle or distorted to any four-sided shape. Also included are facilities to draw ellipses at any angle and sectors, segments and arcs (in Master or BBC B with Acorn GXR). Another of the features of the Support ROM is a 'Turbo DFS' which gives DFS access times comparable with those of ADFS.

Page Layout Section

The Wapping Editor may be used to create pages of any size from an A6 to a full A3 page. If none of the eight default page types suit your purpose, the stand-alone page creation program may be used to create pages to your own requirements. By using proportionally spaced fonts and genuine microspacing it is possible to print over 150 characters across an A4 page. A unique feature of the Wapping Editor is the 'A5 x 2' page size allowing two A5 pages to be printed side by side onto a single A4 sheet.

The graphics module incorporates the facilities like: pencil, brush, airbrush, polygon, circle, eclipse, fill, cut & paste, etc.

Text may be typeset, either justified or unjustified, in any font anywhere on the page. Simply select which font and text document you wish to use, and pull out a rectangle on the page where you want the text to be – it's as simple as that! Multiple columns may be printed just as easily and a special 'expand' feature may be used to expand the microspacing so that the document exactly fits the space defined.

Word-Processor

The integral word processor is the ideal tool for producing your text documents, although text can of course be read in from any of the other popular word processors such as View, Wordwise etc.

The Font Editor

The font editor module will allow you to design your own typefaces or to modify the ones provided on the utility disc. This sophisticated editor has numerous functions designed to take the tedium and frustration out of producing good looking, well balanced fonts. Each character may be individually proportionally spaced and characters of any size up to 16 x 16 pixels may be defined.

Pictures may also be 'grabbed' from a video source by using the Watford BEEB Video Digitiser.

Wapping Editor Software Pack £69
Wapping Editor plus Mouse £89

(Wapping Editor only works with Master Compact if a Mertec Expansion box is fitted)

NEW

At the request of many of our customers we are now able to offer training in the use of Wapping Editor DTP package. For further information please telephone 0923 37774 and ask for Tim or Shiraz

Wapping Art Disc

Over 250K of clip art to cut and paste into your Wapping Editor pages. Pictures include maps, transport, people, media, sport, games etc. Two 'ratio' screens for use with hi-res and rotated A5 pages to ensure images are not distorted when printed out.

Music writing symbols in the form of pattern and brush for quick production of manuscripts are included together with staves.

There are two prepared hi-res pages laid out for printing labels, both single and double width. Ready made label designs are included but these can be easily replaced with your own designs.

A Mode 0 screen dump routine is also included. To pack such a large amount of data onto the discs the screens have been compressed and routines to compress and expand Mode 0 screens are included on both discs. Using the packing routine you can archive large numbers of screens onto a single disc.

£15

Wapping Font Disc 1

Sixteen additional fonts, including smaller version of Oberon and Daisy and two new sizes of the standard font for the Wapping editor. Also included are three Mode 0 screens containing giant 'headline' fonts to cut and paste to create extra smooth headlines. Supplied complete with instructions.

£12

Wapping Font Disc 2

This new addition to our Wapping range of DTP software provides you with additional 23 fonts for the Wapping Editor DTP pack. (80 track discs only).

£13

Laser Direct



By using the power of the Archimedes RISC processor, it offers the best of both worlds – print speed up to 5 times faster than typical Laserjet compatibles – uses outline fonts so that any font can be scaled to any size – works with all programs that use RISC OS printer drivers. Ideal for use with Genesis, IDraw, Acorn DTP, Impression, etc. Includes 50 sheet paper tray and a single sheet/envelope tray. Requires one expansion slot and at least a 2Mbyte Archimedes. A very compact printer, a very low initial cost and very low running costs.

Special Price: £849

- Special High Res Laser Direct Card 600 DPI for Canon LPB4 Laser Printer **£325**
- LPB4 Printer plus High Res Card **£1025**

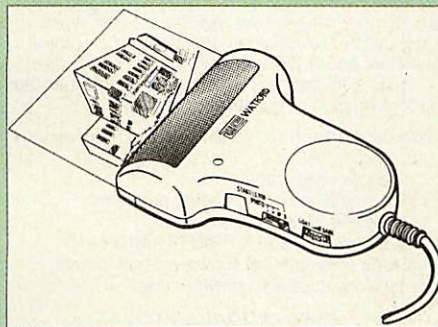
(For demonstration, call in at our retail shop)



**CREDIT CARD 24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383**

**All prices are exclusive of
VAT**

Archi Mk II Hand Scanner



Watford Electronics is now able to offer a complete hand held scanning package, possibly the most essential addition to any desk top publishing system, for only £149. The package includes the most comprehensive utility software available for the Archimedes, a high quality hand held scanner, and all necessary documentation to get you going straight away.

SCANNER

The scanner is capable of scanning up to an amazing 400 dots per inch (DPI)! The scanning area is 4" wide, and the height is only limited by the maximum amount of memory available. The dot resolution may be switched to 100, 200, 300 or the maximum 400 dpi. One of four operating modes may be selected offering either pure monochrome scanning, or one of three grey level modes. The grey level modes use different size dither patterns to represent up to 16 shades of grey. There is also a dial to allow the "brightness" to be adjusted over a wide range, in order to optimise the quality for any specific image. The scanner interface is a standard, single width, expansion card (module) which plugs into the Archimedes' backplane. The socket on the rear panel connects the scanner by 1.8 metres of cable.

SCANNER SOFTWARE

Full use is made of the windowing and the multi-tasking facilities of RiscOS. The software is supplied in a 64Kbyte ROM located on the interface board. The scanner appears as a small icon on the desktop icon bar, and the software is retrieved from the ROM simply by clicking on that icon. As you scan a page, the image appears in the scanning window on the screen, scrolling up in real time. The other facilities included in the software are:

Cropping and scaling to any size including stretching and squashing in X and Y direction separately.

Colour tinting.

X and Y flip.

Edge detection which turns solid objects into outlines.

Selective directional copying which allows features (i.e. lines or text) to be made thicker or thinner.

Scanned images may be saved as sprite files or transferred directly into other RiscOS applications (DTP, Draw, Paint) simply by dragging the sprite file into the application's window. Sprites may also be generated using anti-aliasing. This greatly improves picture quality and is particularly effective when scanning material with a range of grey tones, such as photographs. Images can be printed on any printer that is supported by a RiscOS printer driver, with optional settings for portrait or landscape modes, image scale and positioning. Images are printed using the full resolution of the printer and are not limited to the screen resolution.

On-screen help is provided via the RiscOS interactive help facility. Calls are also provided in the ROM for users wishing to write their own software, incorporating the use of the scanner.

AHS-4 Archi 300/400 Version **£149**
AHS-3 Archi A3000 Version **£175**

Continued → → → → → → → → → →

16K Disc Ram Module

(16K Sideways RAM Module)

Complete with such features as read and write protection, these new modules from Watford Electronics are ideal for the hobbyist, software developer and ROM collector. Key points to note about this new addition to the Watford range of products are:

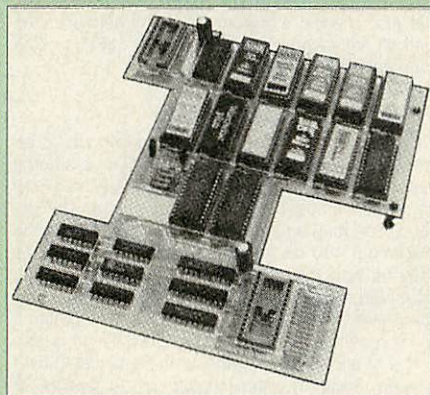
- Write protection (useful in a variety of circumstances)
- Compact construction
- No overheating or overloading problems.
- Free utilities disc supplied
- Can be used as a 16K PRINTER BUFFER.
- Ideal for professional software development.
- Supplied with utilities software disc.

Only: **£29** (carr £2)

Optional Battery back-up fitted

£3

Solderless Sideways ROM Socket Board



The key features of this new, no fuss, easy to install quality product from BBC leaders Watford Electronics are as follows:

- Increase your BBCs capacity for ROMs from 4 to 16.
- No soldering required.
- Very low power consumption.
- Minimal space required.
- Compatible with Torch, DDFS, RAM Card, 2nd Processor, etc.
- Socket 14 takes two 6264 RAM chips.
- Read protect to make RAM "Vanish") allows recovery from ROM crashes.
- Battery backup option for RAM chips.
- Supplied ready to fit with comprehensive instructions.

Price: Only **£35**

Battery Backup fitted **£39**

Battery Backup only **£3**

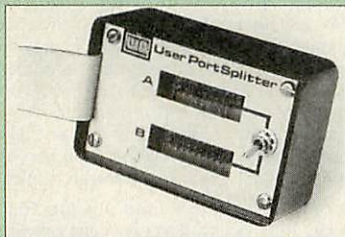
16K Sideways RAM **£8.50**

(carriage £3)

- Sideways RAM Utilities Disc for Solderless ROM Board. Includes the options to load and save ROM Images and the facility to use Sideways RAM as Printer Buffer.

Only: **£8**

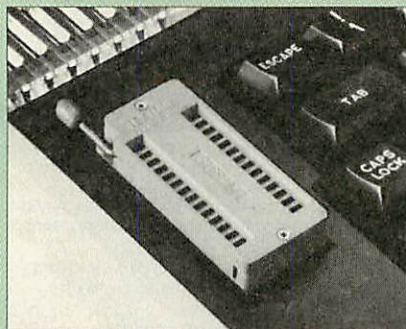
User Port Splitter Unit



Gone are the days when you had to plug and unplug devices from the User Port. This extremely useful little device allows two units to be connected to the User Port simultaneously, and select between them simply by toggling a switch. This device is particularly useful for those people using Quest Mouse and the Watford Video Digitiser or any similar combination

Excellent Value at **£22** (carr £2)

Sideways ROM ZIF Socket System



Allows you to change your ROMs quickly and efficiently, without opening the lid. The ZERO INSERTION FORCE (ZIF) socket is located into the ROM Cartridge's position.

- Very simple to install. NO SOLDERING required. The ZIF (Zero Insertion Force) eliminates the possibility of damage to your ROM pins when inserting & extracting.
- The low profile of the socket allows unrestricted access to the Keyboard.
- All data and address lines are correctly terminated to ensure correct operation of suitable ROMs with the BBC micro. We also supply a purpose designed see-through storage container with anti-static lining, allowing you to store up to 12 ROMs, protecting them from mechanical and static damage.

- This versatile hardware solves the problem of running out of socket space. Simply lift the ROM from the ZIF & insert a different one (No pulling or pushing of Cartridges. It is a must for professionals and Hobbyists alike.)

- BBC, B and B+ compatible.

ONLY **£18** (carr £3)

BBC B Low Profile Cartridge System

Complete System consists of: Low profile ROM Cartridge, Socket housing, Cable assembly, 5 labels and a library storage rack for the BBC B.

- Complete System **£11**
- Spare Cartridges **£2.75**
- Spare Rack **£1.65**

ROM Cartridges for the BBC Master

Will accept the new larger Piggy Back ROMs like: Interword, Interbase, Quest, Conquest, etc

Twin **£9**; Quad **£14**

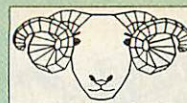
Commander Joystick

Watford Electronics' new Commander Joystick for the BBC B and Master 128K has a unique dual mode of operation giving selective free floating or self centring fully variable control in both X and Y axis directions. Commander is particularly good for flight simulation and drawing programs.

Features:

- Direct connection to BBC Analogue input port – no interface needed.
- Fully compatible with all BBC Joystick controlled games programmes.
- Switchable springs allow selection of floating or centring operation.
- Trim adjusters for both X and Y axes for fine centre adjustment.
- Convenient stick mounted fire button with additional base buttons.

Launch Price: **£15**



ARIES CORNER

B-32 Shadow RAM Card

Like the BBC B+, the B32 provides 20k of shadow screen RAM and 12k of sideways RAM. Unlike the B+, the B32 has simple software commands which allow the user to reconfigure the RAM as 16k of shadow RAM and 16k of sideways RAM, or all 32k as sideways RAM.

With the B32, the programmer gets up to 28k of RAM available for Basic, Logo, Cobal, Forth, Lisp and BCPL programs in any screen mode. The business user gets extra memory for View, ViewSheet, Wordwise Plus, Interword and many other applications. For advanced applications, the scientific user gets access to a massive 47k of data storage using the Acorn approved ★FX call.

Sideways RAM enables you to load sideways ROM images from disc, allowing you to have a large library of sideways ROMs (subject to the copyright holder's permission) stored on disc. The B32's sideways RAM can also be used to extend any operating system buffer (such as the printer buffer) or to load tape programs into a disc system.

The B32 simply plugs into the 6502 processor socket on you BBC micro – no flying leads to connect and no soldering. Provision of the onboard ROM socket means that the Aries-B32 control ROM does not use up one of your existing ROM sockets.

- Recommended by Computer Concepts for use with their Inter series of ROMs.

Price: **£69** (carr. £3)

Aries B-12 Sideways ROM Board

The B-12 provides a total of twelve sideways ROM sockets (the four in the original machine are replaced by the twelve on the board), all fully accessible by the MOS sideways ROM system. In addition, there are two sockets for sideways RAM, giving up to 16k of RAM using 6264 static RAM chips.

If you do not have a B32 or B20, a small adaptor module (the Aries-B12C) is available at a nominal cost

Price: Aries B-12 **£36**
Aries B-12C **£5**

Aries B-488 IEEE-488 Interface Unit

The Aries-B488 is an interface unit to enable the BBC micro to control and monitor IEEE-488 bus systems. The IEEE-488 bus (also known as the 'GPIB' or 'HP IB') is the standard method of interconnecting programmable laboratory instruments and control equipment. Using the B488, up to 15 devices may be connected in a single high-speed data network.

£238 (Carr £3)

Voltmace Joysticks

Delta 3B Single Joystick	£10
Delta 3B Twin Joysticks	£15
Delta 3C Joystick for Compact	£10
Delta 14B Single Joystick	£11
Delta 14B/1 Adaptor Module	£12
Transfer Software Disc-Tape	£7
Delta-Cat A mouse eliminator Joystick for the Archimedes	£24

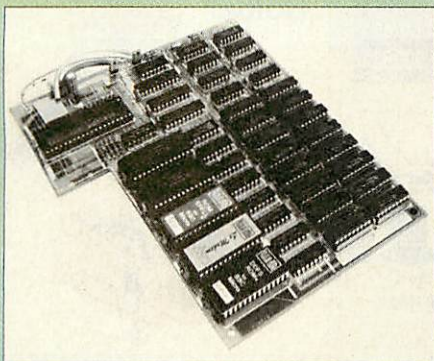
Delta Base B



Analogue aircraft style yoke Joystick to run in the analogue port of the BBC B & Master 128

£25

ROM/RAM Card



Watford Electronics announced the first ever commercial ROM board for the BBC micro, the Watford Electronics 13 ROM Socket Board 7 years ago. Following the success of this board, we have designed what probably represents the ultimate in expansion boards, the new Watford Electronics ROM/RAM board. This highly versatile and sophisticated board represents the latest in "2nd generation" sideways ROM technology for the BBC micro, designed to satisfy the serious BBC user.

- NO SOLDERING required to fit the board.
- NO User Port corruption (avoids problems with the mouse, modems, Eprom Programmers, etc.)
- Fully buffered for peace of mind.
- Compatible with BBC micros (not BBC+ or Master).
- Total number of ROMs increased from 4 to 8.
- Up to 8 banks of sideways RAM (dynamic).
- Option for 16k of battery backed CMOS RAM (CMOS RAM needs one ROM socket).
- Software Write protect for ALL RAM.
- Read protect for CMOS RAM (ALLEVIATES crashes during ROM development).
- Separate RAM write register (&FF30 to &FF3F).
- Automatic write to currently selected RAM socket for convenience.
- FREE utilities disc packed with software.
- Compatible with our DDFS board, 32k RAM Card, Delta Card, sideways ZIF, etc.
- Large printer buffer.
- UNIQUE fully implemented RAM FILING SYSTEM (similar to the popular Watford DFS).
- ROM to RAM load and save facilities.

The SFS (Silicon Filing System) can utilise up to the full 128k of RAM (with the SFS in any paged RAM) as a SILICON DISC. This behaves as a disc drive, with all the normal Watford DFS features (including OSWORD &7F for ROMSPELL, etc.) to provide an environment that looks like a disc but loads and saves MUCH faster.

The ROM-RAM Board plugs into the 6502 CPU socket. This leaves free all the existing ROM sockets, which can still be used normally.

Any ROM that can be plugged into the BBC micro's own ROM sockets may be used in the ROM-RAM Board.

The ROM-RAM Board is supplied with all ordered options fitted as standard. Upgrade kits (with full instructions) are available for all of the options, for later.

PRICES:

- ROM/RAM card with 32k dynamic RAM **£48**
- ROM/RAM card with 64k dynamic RAM **£65**
- ROM/RAM card with a massive 128k dynamic RAM **£109**
(carriage on ROM-RAM Card £3)

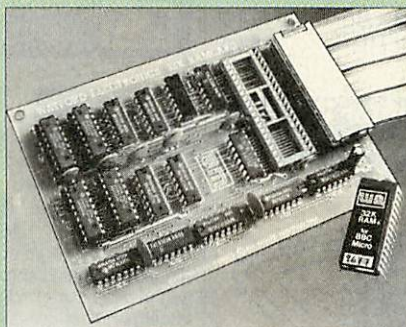
OPTIONAL EXTRAS:

- 16k plug-in Static RAM kit **£9**
- 16k Dynamic RAM for Upgrade **£13**
- Battery backup **£3**
- Read and Write protect switches **£2 each**
- Complete ROM-RAM board **£115**
- All options installed **£115**

P.S.

IS your existing ROM Board overflowing with ROMs? Do you need more Sideways RAM? Is your Board unreliable? Then upgrade to Watford, ROM/RAM Board and pay £5 less.

32K Shadow RAM/Printer Buffer Card Expansion Board



A MUST FOR WORD PROCESSING

Don't throw away your BBC B for a BBC B Plus or BBC Master. Just plug the ribbon cable into the 6502 processor socket, and fit the compact board inside the computer. Immediately you will gain not 16k or even 20k, but a massive 32k of extra RAM!!!

- IMPROVE your WORD PROCESSING system, whether disc or cassette based. Don't wait for a slow printer - type in text while printing. TWO JOBS DONE SIMULTANEOUSLY and £100+ saved on a printer buffer.

- "VIEW" Wordprocessor users can now type in letters in 80 columns and have up to 28,000 bytes free - 5 times as much as normal.

- In WORDWISE (or WORDWISE-PLUS), preview in 80 columns with the full 24k of text in memory. This product is recommended as an ideal complement by Computer Concepts.

- Combine GOOD GRAPHICS and LONG PROGRAMS. Use the top 20k of the expansion RAM as the screen display memory, leaving all the standard BBC RAM free for programs. Benefit from MODE 0/1/2 graphics and 28k of program space.

- Use the FULL 32k or the bottom 12k of the expansion RAM as a PRINTER buffer for PARALLEL or SERIAL printers, sound channels, RS432 etc. Print large text files while running long graphics programs, and have all your buffer options available as well (*FX15,21,138, 145,ADVAL etc). Please note only a 12k printer buffer can be used with Wordwise or Wordwise-Plus, due to the way they are written.

- Unique facility to turn ROMs off and on again. Unlike all other ROM managers, this feature does not use 'unofficial' memory. Two bytes of normally user-inaccessible memory on the RAM card are used to ensure ROMs are disabled WHERE OTHER ROMS FAIL.

Only £59 (carr £3)

(Price includes a comprehensive manual and the ROM)

BBC SOFTWARE'S Popular Educational Software

- Maths with a Story 1 (Disc). 4 primary level maths programs **£20.00**
- Maths with a Story 2 (Disc). 4 further maths programs. **£20.00**
- Picture Craft (Disc) 6-14 age group. Pack consists of flexible geometrical design & colouring programs. **£17.00**
- ECOLOGY O-Level program. **£20.00**
- POLYMERS O-Level program. **£20.00**
- Classification & Periodic Table O-Level. The suite is supplied with its own database of chemical elements which can be classified according to your own rule. **£20.00**
- ADVANCED TELETXT SYSTEM **£8.65**
- PERIOD TABLE SOFTWARE **£20.00**
- Computers at Work - Primary **£17.35**
- Introducing Geography 11-17 years **£17.50**
- Electric Fields 6-14 years **£11.25**
- Espana Viva - 3 Discs **£19.95**
- WHITE KNIGHT Chess game **£16.00**
- A Vous La France **£29.00**

More Educational Software

- **FUN SCHOOL 2 - Red:** Under 6 yrs - 8 programs on Discs, Shape Snap, Find the Mole, Teddy Count, Write a Letter, Colour Train, Pick a Letter, Spell a Word & Teddy Bears Picnic. **£12.00**
- **FUN SCHOOL 2 - Green:** 6-8 yrs - Eight programs on Disc, Number Train, Shopping, Maths Maze, Treasure Hunt, Bounce, Packing Caterpillar, 3 Number jump **£12.25**
- **FUN SCHOOL 2 - Blue:** Over 8 yrs - Eight programs on Disc, Build a Bridge, Passage of Guardians, Unicorn, Logic Doors, Souvenirs, Code Boxes, Mystery Machine & Escape. **£12.50**
- **FUN SCHOOL 3 - Red** **£19.95**
- **FUN SCHOOL 3 - Green** **£19.95**
- **FUN SCHOOL 3 - Blue** **£19.95**
- Six French Games - Aimed at pupils in their first year of French, but also useful as revision for more advanced students 11 years+ **£26**
- More French Games - Another 6 games 12 years+ **£26**
- Au Restaurant and Accident de Route 12 years+ **£26**
- Boulogne and Oh-Les - 2 programs for beginners **£26**
- Letters to French Penpals - 11 years+ **£26**
- French Programs with Henri Beret - The programs in this series present vocabulary, grammar and role-play phrases in the form of animated games. 11-16 **£22**
- Six German Games - Aimed at pupils in their first year, but useful as revision for more advanced student of German. 12 years+ **£22**
- More German Games - Aimed at pupils in their 2nd year of learning German. 12 years+ **£22**
- The Cloze Program - Using context clues to predict is much more than a gap filling exercise. All ages **£26**
- An Introduction to Electronics - Brings together all the basic electronics required for a GCSE Physics or CDT course. 14-16 years **£26**
- Computer Control - This is a package of 3 programs simulating control of a greenhouse, a robotic arm & a chemical plant. 14-16 years **£26**
- The Nuclear Reactor - An interactive, menu driven program for GCSE pupils. Demonstrates & explains nuclear fission & the chain reaction. 14-16 years **£22**
- PUNCMAN Learning punctuation
Puncman 1 & 2 for 7 - 13 years **£15**
Puncman 3 & 4 for 8 - 14 years **£15**
Puncman 5 & 6 for 8 - 15 years **£15**
- Yes Chancellor - A chance to take over number 11 at Downing Street. 12 years+ **£18**
- Letters & Pictures - Introduces phonic skills to Infants 6-8 years **£15**
- Numbers & Pictures - Early number learning is a great fun (4-6 years) **£15**
- Note Invaders - Budding musicians can learn the notes on the Clef with this elegant game 3 programs (7 to Adults) **£15**
- Maps & Landscapes No. 1 (9-14 years) **£18**
- Help Your Child learn Basic Map work No. 2 (9-14 years) **£18**
- Pirate - Educational Adventure (8-14 years) **£15**
- Spelling Week by Week (6-14 years) **£18**

Archimedes Software

- Bookbinder **£43**
- BUMPER DISC **£14**
- Bumper Disc 2 **£14**
- Craftshop 1 **£26**
- Craftshop 2 **£26**
- Desktop Stories **£27**
- Fun School 2A Red (up to 6 years) **£12**
- Fun School 2A Green (6-8 years) **£14**
- Fun School 2A Blue (8 years +) **£14**
- Gate Array Teaching System **£68**
- DigiSim **£35**
- Droom **£17**
- Jiglet **£27**
- Jigsaw **£28**
- Numerator **£60**
- Snippet **£26**

Continued → → → → → → → → → →

Computer Concept's ROMS

Communicator	£49
Disc Doctor	£28
Inter BASE	£49
Inter CHART	£25
Inter SHEET	£37
Inter WORD	£36
Mega-3 ROM	£76
Spell Master	£42
TERMI	£25
Wordwise	£24

Wordwise plus

£40

We are giving away absolutely **FREE**, the superb Word-Aid ROM worth £24, with every WORDWISE PLUS package bought from us.

Word-Aid

The most comprehensive utilities ROM for Wordwise-Plus

Extend the power of your Wordwise Plus word processor with this most advanced ROM from Watford. By utilising the powerful Wordwise Plus programming language, WordAid provides a whole host of extra features, all accessed via a special new menu option. This ROM has been personally approved by Mr Charles Moir, the author of WORDWISE PLUS.

- Alphabetical sorting of names and addresses.
- Text transfer options.
- Chapter marker.
- Epson printer codes function key option.
- Search and display in preview mode.
- Embedded command removal.
- Print Multiple copies of a document.
- Multiple file options for print and preview.
- Address finder.
- Label printer.
- Mail-merger.
- Number/delete/renumber.
- Clear text-segment area.
- BBC B, B+ and Master compatible.

Only £24

(N.B. Word Aid requires a Disc interface in your Micro)

Acorn ROMS

View 3.0 ROM	£45
View Professional	£50
Viewsheets (Acornsoft)	£36
Viewstore	£36
Viewspell with 80 track disc	£25
Viewplot Disc	£20
(Please specify for Master 128 or Compact)	
View-Index	£12
Overview packs 1 & 2	£65
Hi-View	£38

MINI OFFICE II

DISC Version for BBC B & B+	£14.00
DISC Version for BBC Master	£16.00
DISC Version for the Compact	£18.00

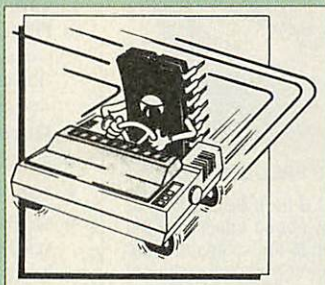
(When ordering please specify for which Micro & 40 or 80 track Disc)

All prices are exclusive of VAT

View Printer Driver Discs

Epson FX & RX 80	£10
Juki & Brother HR	£10

View Printer Driver ROM



View is a powerful word processor, but it seriously lacks in terms of printer driver support. With the View Printer Driver ROM, the View users will find themselves in the realms of advanced word processing.

The VPD extends View's printer command with a series of mnemonic commands. All standard highlight sequences are also supported. A large range of printers are supported by drivers contained within the ROM (the drivers can be downloaded and customised). Printers supported include: Epson's MX, RX, FX, LX, JX80 range, Hi80, KP810/910, PW1080, JP101, HR15, M1009, GLP, Panasonic KX-P1081/2, JUKI 6100, etc.

Other printers are readily supported by defining a Printer Driver using the built-in Printer Driver Generator. The features mentioned below are available to both the built in Printer Drivers and user defined drivers (assuming the printer supports the features).

NLQ control, Underline, Bold, Proportional Spacing, Microspacing, Italic, Superscript, Subscript, Condensed, Enlarged, Double Strike, Set lines per inch numerically (e.g. LPI 6), Set characters per inch numerically (e.g. CPI 5), Select printer font, Select printer ribbon colour, Translation sequences, Emulation of BBC Character Set, Simple numeric expressions for certain operations, Full printer setup, Send control codes, Print prompt on screen, Redefinable Pad character, Pause for key press, Prompt to change daisywheel, and Execute ★ command when printing.

Other features include a very powerful on-screen preview, with bold, italic, underline, super/subscript, enlarged highlights, and a special printer driver to allow memory-based text to be previewed by View 1.4. Of course, View 1.4, 2.1 and 3.0 are all supported, as is Shadow RAM and 6502 Second Processors. The BBC B series and Master series of micros are supported. A comprehensive manual is supplied. All in all, a very professional product for the discerning user who wants power at their finger tips.

Price: Only £33



CREDIT CARD
24 HOUR
Ansaphone Hot Lines
(0923) 50234 or 33383

OFFICE MASTER



CASHBOOK – A complete "Stand Alone" accounting software package for the cash based sole trader/partnership business. It is designed to replace your existing cashbook system and will provide you with a computerised system complete to trial balance.

FINAL ACCOUNTS – Will take data prepared by the Cashbook module and produce a complete set of accounts as following: Trial Balance with inbuilt rounding routine; Notes to the accounts; VAT Summary; Profit & Loss A/C; Balance Sheet.

MAILIST – A very versatile program. Enables you to keep records of names and addresses and then print, examine, sort and find them, all with special selection techniques.

EASILEDGER – A management aid software tool designed to run alongside an existing accounting system. Essentially a Debit/Credit ledger system which can handle sales, purchase and nominal ledger routines to provide instant management information.

INVOICES & STATEMENTS – Greatly reduces the time and cost of preparing Invoices and Statements by storing essential information like customer names, addresses and account numbers. Has VAT routines and footer messages facility.

STOCK CONTROL – Allows you to enter stock received, stock out, summary of stock items and current holdings together with details of total cost, total stock to minimum level, units in stock ordering, quantity and supplier detail.

All this for only £21 (Disc)

OFFICE MATE



- DATABASE
- BEEBCALC SPREADSHEET
- BEEBPLOT GRAPHICS

DATABASE – Set up a computerised card index system with powerful search facilities.

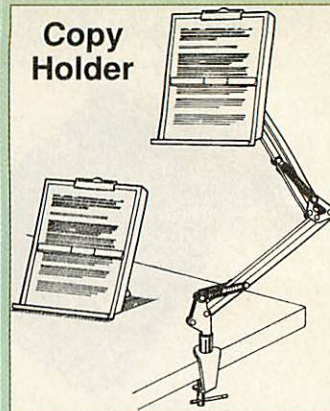
SPREADSHEET – Offers many calculation and editing features

BEEBPLOT – Provides visual representation from Spreadsheet data.

Only £10 (Disc)

Acorn Speech Synthesizer package complete, for the BBC B Microcomputer
Special Offer £14

Copy Holder



Whether you want to type in your latest program or the draft of a new trilogy, Watford's manuscript holders are superb for holding your paper at the ideal height and angle to allow you to read and type in ease and comfort.

Available in 2 full A4 versions, desk resting and shelf clamping. Paper is held firmly by means of a plastic retaining ruler and a clip grip. (for resting books or magazines, the desk top version is recommended).

Desk Top £7 (carr. £3)
Angle poise £12 (carr. £3)

The Epson RX/FX/KAGA Printer Commands Revealed Handbook

Printer Commands Revealed

So you bought yourself a new printer, because the salesman in the shop showed you how clever it is and impressed you with all sorts of printouts to show its capabilities – he may even have offered you a special price.

However, now that you have got it home and connected it to your BBC microcomputer, you are wondering how to make it perform these magical tasks. The manual seems to give no clues, and when you type in the example programs, the computer throws the LPRINT statements back in your face.

Now what do you do, when this £400 piece of high technology refuses even to move its head, and you have stayed up until 2 in the morning with copious supplies of coffee, desperately trying to print something out? Once again, Watford Electronics comes to your help with our new book entitled 'THE EPSON FX-KAGA PRINTER COMMANDS REVEALED'.

This book describes in plain, easy to understand English, how to use and make the most of your KP810, PW1080A or any other Epson FX80 compatible printers like Panasonic KX-P1080/1, etc., with the BBC Micro, both from Basic and Wordwise.

It describes in detail how to obtain the maximum in graphics capability from your printer and includes full indexes allowing you to cross index the numerous commands. Every command is explained in detail, with an accompanying BBC Basic program and an example of its use from Wordwise.

£5.95 (No VAT)

ALL PRICES EXCLUDE VAT

BOOKS (No VAT on Books)

15 Hr Wordprocessing BBC/View	£6.95
15 Hr Wordprocessing BBC/WW & WW+	£6.95
30 Hour BASIC (BBC Micro)	£12.95
1st Word Plus Rel. 2 Manual	£10.00
A3000 Technical Manual	£29.00
Acorn DTP A Guide to	£17.00
Advanced User Guide for BBC	£10.95
Archimedes 1st Step - Beginners Guide	£9.95
Archimedes Assembly Language	£14.95
Archimedes BBC Basic Guide	£20
Archimedes DTP Manual	£10.00
Archimedes Operating System	£14.95
Archimedes Risc-Os Programmers Reference Manual	£79.00
Arm Assembly Lang. Prog. Manual	£15
Assembly Language Quick Ref.	£21.95
BASIC 2 - User Guide	£2
Basic V - A Dabhand Guide	£9.95
BBC Basic Guide (Archimedes)	£19.95
BBC Computer Handbook - The Complete	£14.95
BBC Micro - Within the	£11.95
BCPL User Guide	£9
C Big Red Book of	£8.95
C - A Dabhand Guide to	£14.95
C Programming Lang. 2nd Edition	£24.95
COMAL - Introduction to	£9.50
Deutsch Direkt! (Book only)	£5.95
DISC FILING SYSTEM (DFS)	
Operating Manual for BBC	£6.95
FORTH on the BBC Micro	£9.95
Hackers Handbook - New	£9.95
ISO-PASCAL Reference Manual	£9.95
Mastering Interpreters & Compilers	£14.95
Master 512 Guide - Dabs Press	£9.95
Master Operating System	£12.95
Master Reference Manual Part 1	£14
Master Reference Manual Part 2	£14
Master Reference Manual - Advanced	£17
Mathematical Programs in BBC BASIC	£9.95
MINI OFFICE II - A Dabhand Guide	£9.95
Mouse User Guide to BBC Micro - the Complete	£5.95
Example Programs on Disc for above	£4.95
PASCAL on the BBC Micro	£9.50
PASCAL Programming	£10.95
RISC Technical Manual 260 pg	£14.95
The Epson FX-KAGA PRINTER Commands REVEALED	£5.95
Understanding Interword - A Beginners Guide	£6.50
View 3.0 User Guide	£10
View Guide (View 2.1)	£5.00
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Stop the Confusion!

Do you have to use both Acorn computers and PC's? Would you like to use your Archimedes or A3000 in PC-emulation mode but are unsure of the new commands?

Although Acorn machines (such as the BBC B, the Master, the Archimedes and the BBC A3000) are mainly used in education, most commercial computers use other operating systems, particularly MS-DOS. As a result school computer users are at a disadvantage when moving into 'business' computing. PCs and other commercial computers use MS-DOS as the operating system, so commands for formatting, copying, backing up, printing and the modem are not the same. Even file names are written differently! And did you know that there is one Acorn command which, if used in MS-DOS, wipes everything in the current directory?

'ACORN TO PC' enables you to change over painlessly. It shows clearly and quickly how, why and where the two systems (Acorn and MS-DOS) differ. As with a foreign language dictionary, you can use the book to transfer either way - from Acorn to MS-DOS, or from MS-DOS to Acorn.

'ACORN TO PC' also acts as a handy reference guide to all Acorn star commands and their MS-DOS equivalents. It also has an extensive and readable explanation of the directory tree and hierarchical filing systems in general. Both DFS and ADFS Acorn systems are covered.

'ACORN TO PC' is written clearly and concisely by Dr. John Lockley, who has wide experience of writing and broadcasting. He is currently appearing as a regular contributor on Radio 5, and is co-author of 'The Complete BBC Computer User Handbook'.

Price: £15.95 (No VAT)

The Complete BBC Computer User Handbook

If you own a BBC B, B+, Electron, Master 128 or Master Compact, or Archimedes, then this is the book for you. It shows how to get the best from your machine, and how to make it work for you. The general style and level of presentation means that both the expert and beginner alike will feel comfortable with the quality and quantity of the material. Subjects covered include the general use of computers, hardware design and peripheral devices like printers, disc drives, etc., and Networking. Programming hints and tips and various disciplines for making a better program are discussed in some detail, including debugging of specific errors. Standard programs are covered, such as wordprocessors, spreadsheets, databases, graphics, communications, etc., which brings you neatly on to the subject of using computers in the office or at work - even giving advice on writing and marketing your own programs. A book you will enjoy to use as a reference, or read from cover to cover, over and over.

Only: £14.95 (No VAT)

The Complete Mouse User Guide to BBC Micro

This manual has been written to reveal the secrets of the mouse. It explains all the principles required by the hardware and associated software, and also example listings for inclusion into custom programs. The manual first details the basic principles of the mouse and a simple program which uses these principles. This information should be adequate for most applications. However, it is possible to improve the performance of the mouse by expanding on the principles already used in the software. This is again fully explained and an example program given.

It is possible to gain a full understanding of the mouse from this manual. For those not interested in exactly how the mouse functions, complete example programs are also included. These may be typed directly into the micro, without the need for any understanding of the hardware or software involved, enabling the mouse to be used for custom applications.

Price £5.95 (No VAT)

Example programs on Disc £4.95

Beeb PC (BASIC)

Beeb PC Basic is designed for program authors wishing to convert programs so that they will run on IBM personal computers. To convert BBC BASIC programs manually can waste days of valuable time with every occurrence of common statements such as PROC, DEFPROC, TAB, having to be changed.

Beeb PC (BASIC) automates many of these changes, and will convert majority of BBC statements that are invalid for IBM BASIC into equivalent acceptable statements. In addition BBC BASIC data files can be converted to IBM BASIC format, with support provided for all BBC data formats: - INTEGER, REAL & STRING.

Price: £38

Beeb DOS 3.0

(Now reads Archimedes Discs)

The BBC and IBM PC's are the most popular micros in the UK. The BBC is firmly established in the education sector and the IBM is the industry standard in the business world. The pools of information and applications held on these computers are immense, yet the means of passing information between them are very limited. Beeb DOS provides a practical method of transferring information between these two micros.

Beeb DOS is a collection of utilities which run on the PC's and enable it to read and write information on BBC discs. You can transfer files between your PC's 360K floppy, high density floppy or hard disc and your BBC discs. In addition Beeb DOS allows you to catalogue, format and compact BBC discs and delete, re-name, lock and unlock BBC files, all on PC's. Each Beeb DOS utility is written in IBM assembler and is run directly from PC or MS-DOS. The Beeb DOS utility can be run from floppy disc, hard disc or RAM drive.

Beeb DOS is supplied on an IBM 5.25", 360K disc complete with a comprehensive operating manual. (Will only work on 360K Disk Drives & read only ADFS and Watford DDFS - not DFS).

Price: £39

(Please write in for technical literature)

Continued → → → → →

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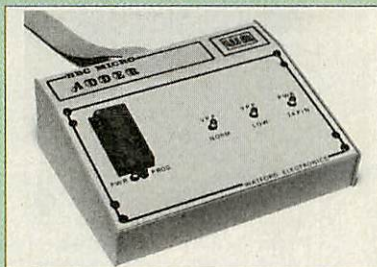
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ADDER



The Adder unit connects to the User Port and draws its power from there too. The EPROM is mounted in a top quality ZIF socket. There are no switches or controls as Adder is entirely software controlled.

The Adder software provides sophisticated facilities for programming EPROMs from a RAM image produced by loading disc files. The software is menu driven and designed for ease of use.

Features:

- Two ultra fast programming algorithms or standard slow algorithm.
- Supports standard 21V programming and newer 12.5 volt EPROMs. (Software switched).
- The RAM image to be programmed can be built up in many ways. Sections of image can be loaded separately. Part programming. Read EPROM. Edit data in memory.
- Automatic processing to handle a list of files to program into the EPROM.
- Automatic disc buffering to allow programming of 32K 27256 devices from a 32K file without extra effort.
- Verification gives detailed error list and checksums are maintained. There is also a blank check facility.
- Works with all standard filing systems. Generates header code for RFS ROMs to allow Basic programs etc. to be stored in EPROM. More than one file per ROM permitted.
- Programs the following EPROMs: 2516, 2716, 2532, 2732, 2764, 27128, & 27256.

£65 (£5 Carr)

TEX EPROM ERASERS

EPROMs need careful treatment if they are to survive their expected lifetime. Over erasure of EPROMs very rapidly turns them into ROMs! The TEX erasers operate following the manufacturers specifications to give the maximum possible working life by not erasing too fast.

- **ERASER EB** - Standard version erases up to 16 chips. **£32(carr £3)**
- **ERASER GT** - Deluxe version erases up to 18 chips. Has automatic safety cut-off to switch off the UV lamp when opened. **£35 (carr £3)**
- Spare UV tubes. **£12**



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Antistatic Aerosol Spray

Ideal for cleaning and preventing static build-up on TV/Monitor Screens.

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Ideal for removing dust & dirt from Keyboard & similar inaccessible spaces.

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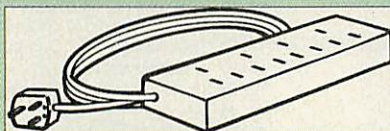
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Surge Protector Plug

Fitted in place of your normal mains plug, this device protects your equipment (and data from corruption), against mains high voltage transient spikes/surges caused by lightening or thermostats switching.

Protection for only **£8.50**

4 Way Mains Distribution Socket



4 way top quality mains trailing sockets. Supplied wired up with mains plug ready for use. Can be screwed to floor or wall if required. Very useful for tidying up all the mains leads from your peripherals.

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A 4 way mains distribution unit as above with a built-in Surge Arrester, providing protection for your complete Computer/Hi-Fi System

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ROM Extraction Tool

This extremely useful tool allows you trouble free chip insertion and removal from your computer by distributing the removal force over the whole body of any 24 or 28 pin chip.

£2

Metal Chip Extractor

£3

28pin DIL Header Plug

SOLDER type **£1.50** IDC CRIMP type **£1.95**

8 Way DIP Switch

Increase the speed of your Disc Drives by soldering this switch to your BBC B or B+ keyboard

Only **£1.00**

28 pin ZIF SOCKET (Textool) **£6.95**

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(All ready made and tested)

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to 3 pin DIN Plug + 1 Jack Plug	£2.50
to 7 pin DIN Plug	£3.00
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Disc Drive Power Leads

Supply from BBC power supply to standard Disc Drive Connection: Single **£3.00**; Dual **£3.75**

Disc Drive Interface Leads

BBC to Disc Drives Ribbon Cable
Single **£4** Twin **£6**

Miscellaneous Connectors

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RGB (6 PIN DIN)	50p	75p
RS423 (5 pin Domino)	70p	80p
Cassette (7 pin DIN)	40p	95p
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Paddles (15 pin 'D')	150p	250p
Disc Drive Plug 4 way	100p	-
6 way Power Connector	120p	150p

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Convert two single Disc Drives into one Dual Drive with this simple external unit (Suitable for Disc Drives with PSU. For Disc Drives without PSU, you will also require Watford Power Duck, see below).

£14

Watford POWER DUCK

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4013	75p
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4164-10	£1.55
4464-10	£3.50
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41256-10	£1.50
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74LS245	£1.00
74ALS245	£2.75
74LS373	£1.00
74LS393	£1.00
75453	£1.00
75159	£3.00
9637	£2.00
ICL7673PA	£3.00

Assorted ROMS



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User Guide	£22
Acorn BCPL	£42
ACORN DNFS	£17
Acorn FORTH	£32
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ROMIT	£29
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TED	£35
Terminator B, B+	£28
Terminator Master	£32
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Hi-Speed, Low Cost IDE Hard Disk Drives for Archimedes

Watford's NEW Innovative IDE interface card brings the latest advances in PC hard disc technology to within reach of the Archimedes user. Over the last few years PC hard disc manufacturers have been working towards the goal of integrating the drive controller onto the hard disc, eliminating the need for an expensive controller card.

Now this has been achieved and drives are available under names such as IDE (Integrated Drive Electronics) or ATA (AT Attachment). These drives require only simple interfacing to a PC motherboard and reduce the overall cost of installing a hard disc. Because of the integration of the controller and drive electronics onto one compact board, manufacturers have been able to include extra features into the drive, such as Caching, where tracks are buffered in fast memory, reducing access times and increasing throughput. All these benefits make IDE drives far more attractive than conventional ST506 drives or SCSI. Watford's advanced interface allows IDE drives to work on any Archimedes machine, speeds in excess of SCSI devices can be obtained at a fraction of the cost of a SCSI drive.

Up to four drives are supported by the IDE filing system IDEFS, up to two drives can be attached to each expansion card, up to four cards can be installed in a machine. An optional 20Mb or 40Mb hard disc can be supplied on the podule expansion card itself, with its fast transfer rate and power saving modes the drive is ideal for storing commonly used software such as the IFonts application.

A powerful security feature has been provided with the two unique commands *IDELock and *IDEUnlock, ideal for educational establishments where hacking or tampering may be prevalent that may lead to loss of data. Once locked, the configuration can not be changed until a secret password is used. The !IDEForm Write Protect option is particularly useful in conjunction with *IDELock as it will prevent any unauthorised deletion of data.

By an innovative use of on-board memory, the card will remember its configuration, even if moved to another slot or even a different machine, this also includes the unique security features.

Hardware

- Single width EuroCard
- Supports proposed ANSI ATA (IDE) specification
- Fast 16 bit MEMC interface interrupt driven to support background disc operations
- 5 Mbytes per second peak transfer rate
- Built in Non Volatile RAM to hold configuration
- LED activity indicator
- 37 way D type socket for external drives
- Optional on-card 20Mb or 40Mb hard disc
- Up to two drives (master and slave) per card
- Multiple cards per machine (up to four)

Software

- Conforms fully to the Acorn IDE Specification
- All software supplied in ROM
- Filing system 'IDEFS'
- Desktop filer with drive ready detection and disc name under icon

cont./-

- !IDEForm, WIMP based configuration and formatting software
- Drives can be individually write protected
- Up to four drives over multiple cards
- Power saving standby modes supported with configurable timeout
- Drives can be used without translation in native mode for minimum overhead
- !IDEFSDisk, creates PC emulator hard discs

*Commands

*IDELock
*IDEUnlock
*IDEFS
Selects the IDE filing system 'IDEFS'.
*IDEDrives
Displays the configuration and native characteristics of installed drives.
*Configure IDEFSDirCache
*Configure IDEFSBuffers
*Configure IDEFSDrive

Typical transfer speeds

Prairie Tek	20Mb	650K bytes per second
Seagate	43Mb	800K bytes per second

Prices

Part No.	Capacity	Access Speed	Price
ADA 0520	44Mb	28mS	£249
ADA 0530	89Mb	19mS	£395
ADA 0540	130Mb	19mS	£599
ADA 0550	142Mb	15mS	£699
ADA 0570	200Mb	15mS	£790
ADA 0580	330Mb	15mS	£TBA
ADA 0590	670Mb	15mS	£TBA

All the above drives are supplied complete with Controller Card, cable & Software on ROM. (Internal fitting)

Ideal for use with A300/A400/A500 Series machines.

For A3000 users an additional external Case and PSU will be required.

AAA 0300 External Case & PSU for Above £85

Internal Hard Disc Drives for A3000

ADA 0700	21Mb	23mS	★£315
ADA 0720	44Mb	28mS	Available £TBA
ADA 0730	89Mb	18mS	Soon £TBA

Supplied complete with Podule, Fan, Cable & Fitting instructions.

★ Tentative Launch Price

Hard Cards

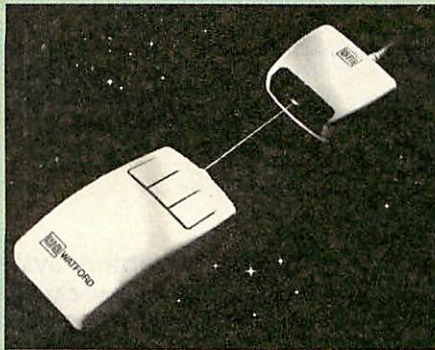
Hard Disc on Cards for Archimedes

2.5" Hi-Speed Hard Disc Drive on a controller card.
"Simply plug and play"
For Archimedes A300 and 400 series machines

ADA 0650	21Mb	23mS	£345
ADA 0660	44Mb	28mS	£495
ADA 0670	89Mb	18mS	£TBA

(Can be used as a Removable Hard Drive)

NEW Archimedes Cordless Mouse



Ever found that using a mouse on a busy desktop has its problems? The cable is always being caught up in papers, tangled round equipment and other cables etc, and what about that cup of coffee spilled over your work!

Watford Electronics' new Cordless Mouse solves these problems by removing the cause for concern - replacing the cable with a simple infra red link. It still provides all the speed and easy control of a conventional mouse, but with complete freedom. In use, there are no operating differences between the standard mouse and the new cordless mouse so all mouse functions and mouse driven RISC software will be fully compatible. Pinpoint accuracy is ensured by a unique Accelerator button, which, when pressed, moves the pointer by just a tiny amount for a large slow movement of the mouse, but by a large amount for a quick wizz of the mouse.

Features

- Infra Red Signal Transmission
- High Resolution 200 DPI
- High Tracking Speed of 600mm/s up
- Anti-static Silicon Rubber Coated Ball
- Low Friction Teflon Footpads
- Power - by two AAA size batteries (not included)
- Automatic Standby Mode after 5 seconds inactive
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Weather Data

Weather Satellite Systems Now available for the Acorn Archimedes A310 and A3000. This Meteosat systems comes complete including everything from the Antenna to the software. Animation is standard allowing the dynamic progress of weather fronts to be monitored and tracked. High resolution images of 800 pixels by 800 lines can be stored and manipulated in colour or grey scales on any standard colour monitor. Acorn Change FSI registered and compatible. Capable of receiving up to 400 images every day this remarkable system costs just £799.00. Other Timestep products include a fully featured LANDSAT Image Processor with 20 field study images and three full colour manuals. Acorn Change FSI registered and compatible at only £59.95.

PC Globe and **PC USA** are full colour graphical databases of the world with an amazing amount of retrievable data. The special Timestep education price is only £59.95.

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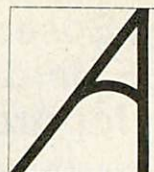


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EIGHT-BIT ATOMS

B Readers of the erstwhile
B Risc Revue will be fam-
M ilar with a game called
C *Atoms* – written for the
E Arc by Adrian St John.
A Garry Quested of Herne
Bay has supplied a ver-
sion for Beebs, Masters
and even Electrons. You'll
find the two listings needed on
the yellow pages.

The game is a faithful adap-
tation of the original and the
computer-player uses the same
algorithm as supplied by L C
Howe in June's Risc Revue.
To play first enter and run
MakeAts. This assembles some
machine code and other data,
saving the result as a file
called *AtCode*. Now enter and
run the main game – *Atoms8*.
This loads the *AtCode* file and
produces a display similar to
the Archimedes version.

You are provided with a
simple menu screen. To select
the number of players press
two to six. Each player can be
computer or human controlled.
The setting is marked by a C
or H on the colour for that
player. To change the setting
use the cursor keys to move
the arrow to the desired colour
and press RETURN to toggle the
control setting. When you are
ready to start press S.

Players take turns to place
atoms of their own colour on
the board. You can put an
atom on any empty square,
shown as grey, or add one to a
square of your own colour.
When the number of atoms in
a square exceeds the critical
value an explosion occurs.
One atom flies out in each
direction, horizontally and ver-
tically, converting the square it
reaches to its own colour. The
initial explosion may cause a
chain reaction as other squares
become unstable. The object
of the game is to remove all
your opponents' atoms from
the screen. The critical value

★ INFO

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of a square depends on where
it lies. Corners have a value of
two, side squares three and
central squares four. The value
is the number of adjacent
squares.

Garry's program works in
mode 1, leaving little memory
free for the game. That is why
the code and other data has to
be loaded in. You cannot use
shadow memory when run-
ning the game as part of the
code directly pokes the screen
memory and PAGE should be
no higher than &1100 when
you CHAIN "Atoms8".

He employed various cun-
ning devices to make the game
look pretty on a Beeb. Mode 1
provides good screen resolu-
tion but the limited colours
means that some work is
needed to produce the range of
colours required. Squares are
plotted by the *showatom* routine
which is provided with a pair
of bytes to describe the colour.
The atom squares are stored as
white with black dots and the
byte pair is ANDed with this
uncoloured image to produce
the appropriately coloured
square. *Atoms8* shows that red,
white and blue can be mixed to
produce a nice variety of hues.

The locations of the
machine-code routines and
board data are passed to
Atoms8 in the first part of the
AtCode file. The board con-
sists of two 70 byte blocks of
memory – one containing the
number of atoms in each
square and one their colour.

If you run *Atoms8* with six
computer players it will play
as if you had run the Archi-
medes version, a good test of
the faithfulness of the adapta-
tion! It is quite easy to add a
random element to the Arc
version, although it will take a
bit of machine-code, or a ran-
dom number generator at the
least, to do the same for the
Beeb program. The extra lines
needed for the Arc version are
given as *AtomRand*. Add these
to the original game from the
April and June issues.

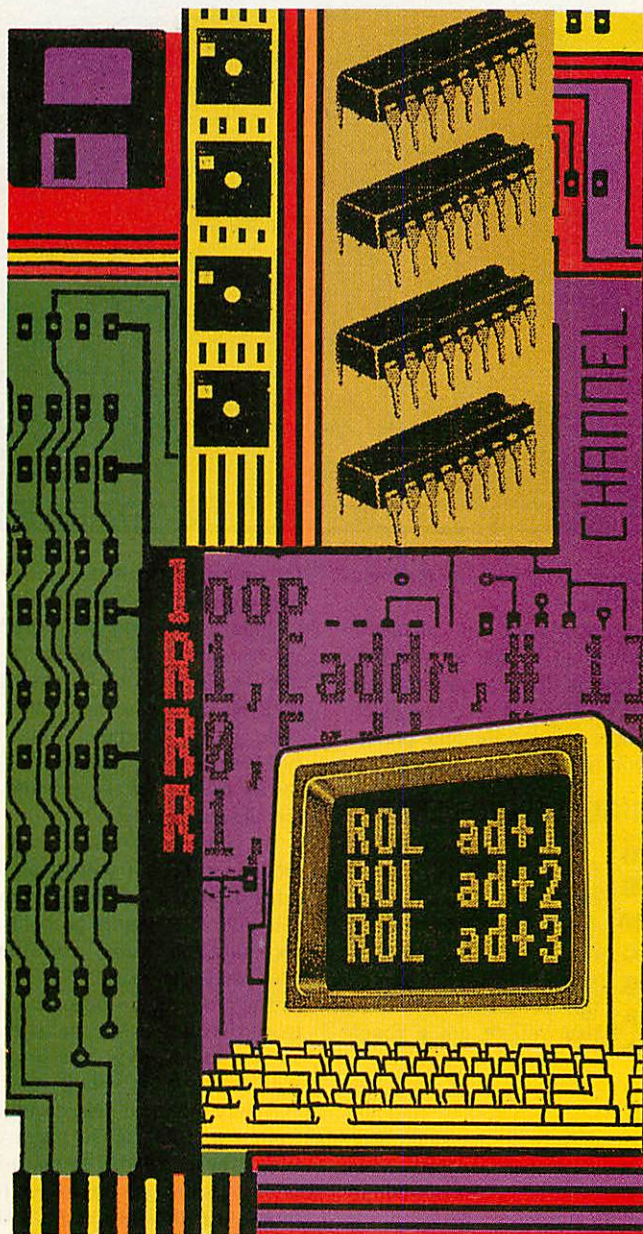


Illustration by Andy Lovell



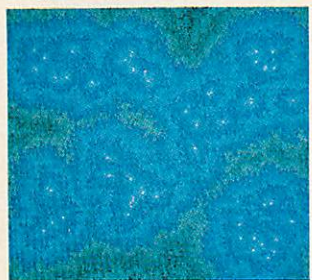
UNDER THE SEA

B Hot on the heels of last month's nature theme is *Coral32*, a submission from Jan Vlietinck in Belgium. This simulates the growth of coral to produce some very attractive results. It takes a start pattern, generated by the computer or drawn with the mouse, and randomly encrusts it with colour. Jan's program was written for the Archimedes, but as usual we've come up with an eight-bit version called *Coral8*.

When run the Archimedes version draws a square box on the screen and will allow you to draw an initial pattern by moving the mouse, holding down the left button. Pressing the right button will produce a random smattering of pixels around the pointer, rather like an airbrush. When you are happy with your pattern press the middle button to start the growth stage. A mouse click when the plotting has finished will re-run the program.

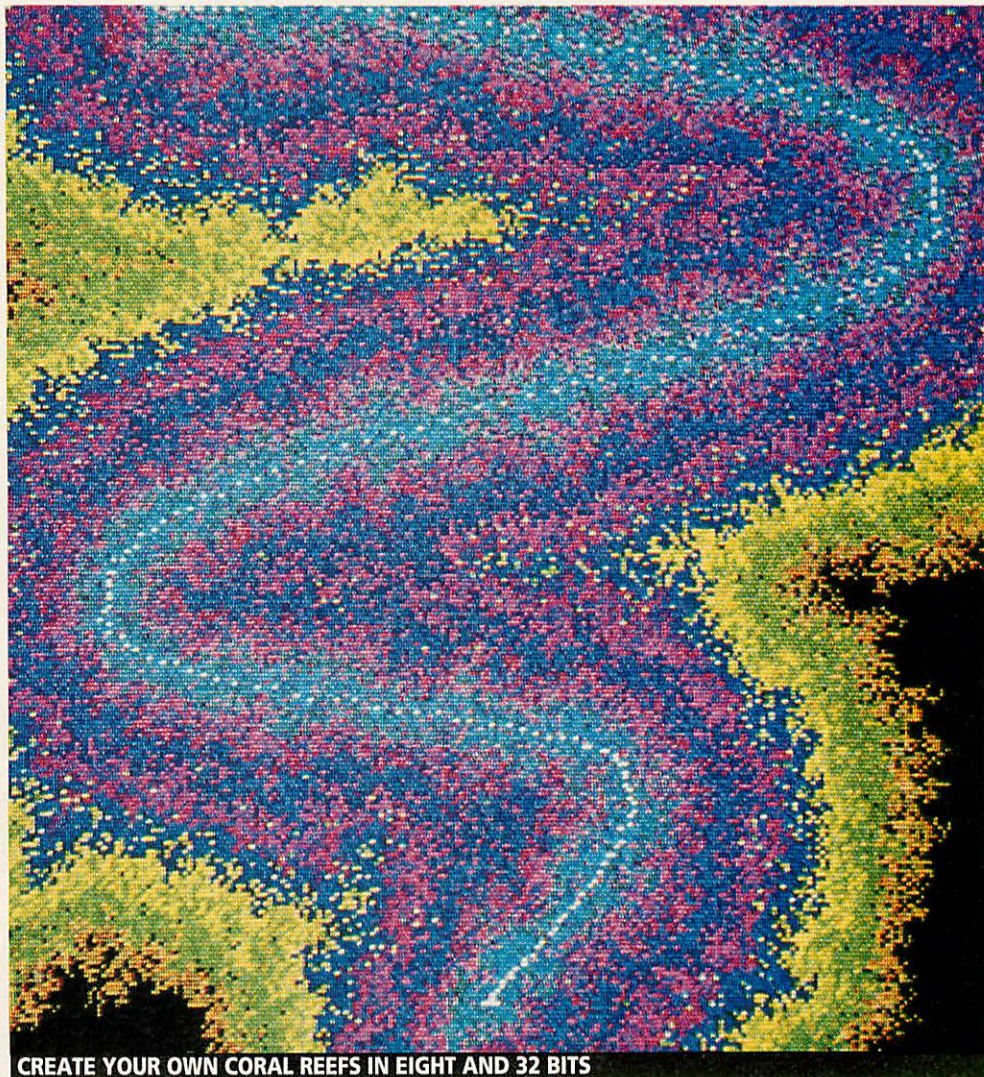
As the BBC has no mouse the eight-bit version plots 10 random points for its initial pattern. If you have an AMX or Quest mouse you may like to add a suitable code to allow a user pattern to be entered.

The program works by picking a random point on the screen and, if it is black, checking the surrounding eight pixels. If any one of these is not black it will colour the original point. The actual



UNDER THE DEEP BLUE SEA

colour used is picked by a very contrived calculation in the 32-bit version and a relatively simple one in the eight-bit version. In essence, a certain colour is used for a fixed number of pixels. The 32-bit version is more complicated because it makes use of 256



CREATE YOUR OWN CORAL REEFS IN EIGHT AND 32 BITS

colours, compared to the eight-bit's seven.

Luckily all this calculation is hidden so that all you have to do is don your snorkel and flippers, put a piece of velcro under your nose and pretend you're Jacques Cousteau...

BIGGEST AND BEST

B *Biggest is a utility to find large files, directories and applications. If you suddenly find yourself running out of space on your hard disc, running this program may reveal that you've got a couple of files of a megabyte or more that you don't need. You can use *Biggest to find any particularly overloaded directories, or even to track down your most storage-hungry applications.

It has been written in Basic

for simplicity but makes use of two operating system calls, including OS_ReadArgs covered in last month's *INFO, to allow parameters to be passed to it as if it were a machine code utility. To run it simply type *Biggest, optionally followed by any of the parameters described below.

If you supply the single parameter -help, it will display a list of all the parameters you can give it - you'll probably recognise the format from the *EveryWhere command.

The program has been set up to run with sensible defaults, so if you just type *Biggest it will recursively search your currently mounted disc starting from \$ to find the 30 biggest files. These will be displayed in descending order along with their full pathnames, types and sizes. Supplying the Number

parameter allows you to change this default of 30. This was picked so as to fit the final list comfortably on a mode 0 screen, but you may well have a multisync or 19in mono monitor and be able to display 60 or more.

The next two options Type and Exclude let you select more precisely which files you want to count. Both can be followed by a single file type name such as Basic or a type number like &FFB or a list of types separated by semicolons, for example - Text; &DDC; Sprite. Type specifies the files you want to count and Exclude will count all except the ones you supply. For obvious reasons, you cannot supply some of each. As an alternative to these two options you can supply either the Applications or the Directories flag.



As Risc OS applications are not single files but whole directories you cannot simply specify a file type to the Type parameter. The Applications flag recognises a Risc OS application if a directory contains a file called RunImage. In this case the size of the files within that directory are added up. It is by no means law to have a file called RunImage, so **Biggest* can't be totally fool-proof; it just does the best it can. The program functions a little differently if the Directories flag is used. No recursion is used, so only the directories in the root are dealt with. Instead of counting files individually, the size of all the files within each directory in the root are added up, and the directories are ordered according to their total size. This is like doing **Count R* for each directory.

As mentioned before, the program defaults to starting its search at *s*. This can be changed with the Root parameter. Note that in **EveryWhere* this was Directory. We have now changed **EveryWhere* to accept Root instead. In the example of **EveryWhere* below we have used Root, so to change your copy simply change the "directory/k," in line 3410 to "root/k," and the "Directory" in line 3670 to "Root" then re-run the program to assemble the code. You should also change the D in last month's **Lock* and **UnLock* examples to R to maintain compatibility.

Next on the list is Single. This switches the recursion off and will just count the files within the given root. Directory sets this automatically. Format allows you to change the way the file sizes are printed; Decimal, Hexadecimal and Textual, or any abbreviation thereof, are allowed. The first two should be self-explanatory; the last is the approximate form used by the **EX* command.

If the Path flag is given, then the full path name of each file will be printed in the final output rather than the file name and the path name to it. This reveals a rather nasty display problem – what if the resulting output is longer than 80 characters? Well, there's not really much that can be done,

```
!SepCopy D Biggest MR Coral32 MR Coral8 MR CoralUfig MR
Fig1 MR FontBoxes MR Jiggle MR Jiggle2 MR LdPicARM MR
#biggest -r $.*Info -t Basic -n 10
10335 EverySrc BASIC $.*info.Aug91
8888 GwaupScape BASIC $.*info.Aug91
6999 LdPicARM BASIC $.*info.Sep91
6874 Scroll32 BASIC $.*info.Aug91
6845 SortDemo BASIC $.*info.July91.Listings
5278 Biggest BASIC $.*info.Sep91
5876 3DLiss8 BASIC $.*info.July91.Listings
4979 Scroll8 BASIC $.*info.Aug91
4563 Coral8 BASIC $.*info.Sep91
4165 Heaping BASIC $.*info.July91.Listings
#biggest -help
Find large files and directories
Keywords:
Upper case indicates allowable abbreviation
-Number : Number of objects to display (default 30)
-Type : Filetypes to count (separated by semicolons)
-Exclude : Filetypes to exclude (separated by semicolons)
-Directories : Count directories rather than files
-Applications : Count Risc OS applications (identified by !RunImage)
-Root : Set directory to start from (default s)
-Single : Only count 'root' directory (don't recurse)
-Format : Set file size format (Decimal, Hexadecimal, Textual)
-Path : Print full pathnames rather than file and path
-Split : Print pathnames on a new line
-Verbose : Display directories searched
-Help : Display this help
$
```

MEGA COMMANDS PART TWO

except to buy a bigger monitor! However the Split flag is provided to ease the situation. If present, the path name will be printed on a new line after the file size and type.

The final twiddle you can give is Verbose. This does not effect the final output of the program in any way, it merely provides a mug watch.

We thought that eight-bit users might find a version of **Biggest* useful. Many will use ADFS as their main filing system and those with Econet could certainly find such a utility helpful. The eight-bit program *Big8* is a menu-driven affair that runs in mode 7 as quite a lot of Ram has to be set aside to store full pathnames.

Upon running *Big8* you are presented with the main menu. The first option is Start search which begins the counting process. To select which directory to search, the default being *s*, select the second option on the menu and enter the pathname.

Although file types are not officially implemented on eight-bit machines, it is often possible to spot certain sorts of file by looking at their load and execution addresses. If you select the third option on the main menu you will be given a list of possible types to search for.

The All files option is self-explanatory. Directory when selected will cause directories rather than files to be counted – just like the Arc version. This may be useful to Econet managers who want to find out

which users are guilty of gobbling up the most storage space. The remaining options can be selected individually. You may look for one or more at a time – an arrow to the left of an item indicates whether it will be searched for.

The file types are stored as a list of names in DATA statements at the end of *Big8*. Each type has a corresponding function with the same name, but if a file type is more than one word long only the first word is used for the function name. It is easy to add your own type to the list. Simply include the name in the list before Other and add your own function.

Each function takes as its parameters the load and execution addresses of a file and its size. It then checks these to see if they are consistent with the particular file type and then returns TRUE or FALSE accordingly. For example, FNScreen looks for mode 0, 1, 2, 4 and 5 screens. These will either have load addresses of &3000 or &5800 and a corresponding length of &5000 or &2800. It is perfectly possible to save a screen with different addresses – the absence of official file types means that *Big8* can only provide an approximate guide.

The Verbose and Recurse options may be toggled on and off. In Verbose mode the five biggest files are shown as full pathnames, load and execution addresses, size in bytes or K, and suspected type if appropriate. Without the Verbose option the 20 biggest files are

shown with their sizes in bytes. Any pathnames too long to fit on the screen are truncated and prefixed with '...'.

The Recurse option is normally on but may be switched off if you just want to look at the files in a directory and ignore any subdirectories. It is irrelevant if you have selected type Directory. Press ESCAPE at any time to return to the menu.

One feature of *Big8* which deserves a mention is its use of linked lists. The Arc can shuffle the contents of arrays very easily, but moving filenames and other data about on a Beeb can take a long time. For this reason the information for each file displayed by *Big8* is inserted into a list. The first entry, that is the smallest file shown, has entry number list% and the array next%() is used to store the position of the next biggest file. The value in next%() for the biggest file of all is -1, indicating the end of the list. In this way, no unnecessary memory shuffling need be done when a new file is found – the contents of the pointers in next%() are simply altered.

Incidentally, *Big8* is not compatible with DFS. It is only really worth running it if you have a large directory structure, and DFS discs don't have proper directories.

LOCAL CALLS

B If you have moved onto the Arc from a Beeb or Master you may not yet have discovered all the extra facilities Basic 5 has to offer in the way of local variables. On the Beeb it was generally only possible to pass named variables to FNS and PROCs eg, fred\$, jim%. The Arc allows many other sorts of variables to be used locally though. Arrays can be given as parameters and, perhaps even more surprisingly, so can memory locations. *LocalTest* illustrates the idea.

Three pieces of information – a byte, a word and a string – are all stored in a block of memory and displayed. A procedure is then called with different values and these overwrite the original ones. However, because the param-

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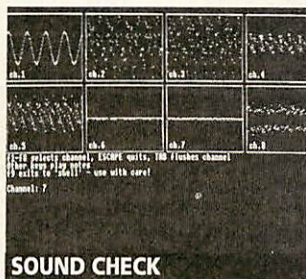
ters given in a DEF statement are local, the original values are restored when the procedure comes to an end. Apart from its value in terms of consistency of variable types, this feature is particularly useful when defining procedures that pass on parameter blocks. For example, many Wimp calls, like SYS "Wimp_OpenWindow", require large blocks of data to be prepared. The parameters can simply be passed straight into a block of memory without fear of changing the original contents, like this:

```
DEF PROCOpen(!q%,
  q%:14,q%:18...)
SYS "Wimp_
  OpenWindow",,q%
ENDPROC
```

MAKING WAVES

B John Grayley has provided a graphic demonstration of the Arc's sound system in action. Wave displays the waveforms of all eight sound channels as they are playing. With care you can run your own sound programs and watch their output.

Run the program and eight boxes will appear – each containing a display of the current output of a voice. To play a note press a key on the main keyboard which has been set up to imitate an organ. There are two manuals – from Z to / and from Q to \. These form the



white notes and the black notes are found in the rows above. To select which channel to play on press F1 to F8. You can also flush the current channel by pressing TAB – this will kill the current sound, leaving a snapshot of its waveform on the screen.

To quit press ESCAPE. Alternatively press F9 which provides a Basic shell. In fact this simply moves PAGE up above Wave so that the code to do the plotting is left intact. If you

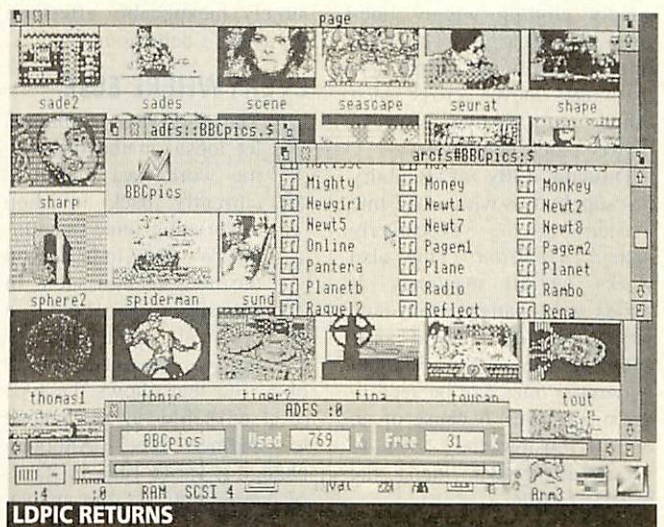
are careful you can run your own program. Any sounds produced will be shown in the boxes. Note that you must remove any lines from programs which might cause the screen to be corrupted, eg. any mode changes. You should also press CTRL-BREAK when finished to be safe.

The program is as legal as it can be, considering what it does! For example, the official start of screen memory is read for the plotting routine to use. However, several adventurous techniques are employed to allow the waves to be shown. Everything revolves around the redirection of certain branch instructions in the headers of the Arc voice generators. Wave calls the original routine and then uses the sound data to plot the graph. It is assumed that the addresses of the voice generators are stored consecutively &40 bytes into the sound system data block, and this is how the program finds the locations of the branches it must redirect.

AHHH... LDPIC!

B Long standing readers of BAU may remember a cunning BBC screen compression utility called SvPic. It was first published in October 1986 although it made its debut on the BAU Gallery Disc long before that. We recently came across a lot of BBC screens compressed with SvPic. Instead of decompressing them on a Beeb, transferring them to the Arc and tediously converting them, I wrote some Arm code to do it all for me. The result was a utility type file called *LdPic which decompresses any BBC screen in SvPic format and converts it to Archimedes mode 12. From here the screen can be *ScreenSave'd. I archived all the pictures I had with Spark and included an index sprite generated by Chris Ruseman's PicList application from a couple of months back. To use it just type *LdPic followed by a filename.

Expanding data onto an alien screen layout was far from trivial. In the end I kept a track of the BBC screen



address and converted it to an Archimedes address whenever a pixel had to be plotted.

Separate routines had to be written for converting the different BBC modes because of the various ways the screen memory can be laid out.

A general purpose routine could have been written, but it would have probably been longer than the 50 lines used here.

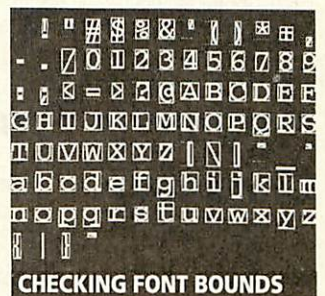
LITTLE LAMBS EAT IVY

B I recently wrote a program that generated a drawfile and needed to centralise letters within boxes. So I duly consulted the PRM to find the appropriate SWI to find the width of a character.

There are three possible calls which all do subtly different things. It was only after writing FontBoxes that I found the differences. Font_StringWidth is a complex SWI that will split a string intelligently, and can cope with font and colour changes. It is more attuned to text formatting than simple width calculation. On the surface the other two are very similar. Font_StringBBox returns the bounding box of a string and is the call I originally used to centralise my characters; Font_CharBBox returns a character's bounding box.

The important difference is that Font_StringBBox takes into account any extra padding around characters to make them monospaced for exam-

ple. Font_CharBBox merely returns the maximum extent of the character itself. Its width can then be found by subtracting the minimum x from the maximum x as returned by the SWI. This is the call I actually used. The program FontBoxes demonstrates the difference



between these two calls. Both sorts of bounding box are ascertained. StringBBox is plotted in red and CharBBox in green.

To see the characters correctly anti-aliased, you'll need to have FontMax2 configured to around 40.

SMALL WONDERS

B We have three one-line wonders for your delight this month. Jiggle comes from Donna Parry of County Durham, building on her earlier success with Wiggle in the last ever Eight Bits column. It works on all machines and can be entered without using keyword abbreviations. The picture produced has a curious, three-dimensional appearance and is made up by



simply plotting wiggly lines from left to right. The only rule to keep things in order is that lines never cross each other but always squeeze between their neighbours.

Duncan Lilly of Banbury has supplied us with a one-line masterpiece he evocatively named *EyeStrain!* This also works on all machines. It builds up a pattern from sine waves, by plotting them vertically up the screen. Parallel horizontal lines can be seen in the picture but, because of an optical illusion, they seem to get closer together – hence the program's title.

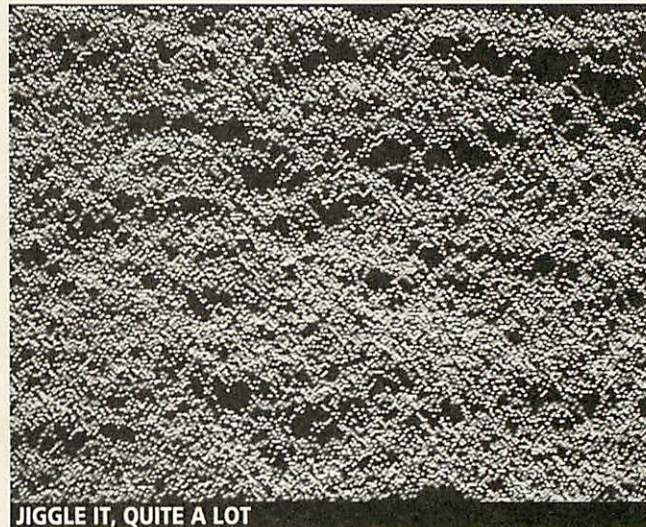
Finally we have an updated version of David Walters' amazing *String Thing* one-liner – see Risc Revue, May 1991. The enhancements come courtesy of **Ray Porter**.

He has added colour to the original and allowed the size of the string creature to be changed with the left and right mouse buttons. If you reduce its size enough the radius of each segment becomes negative. This has a curious and

largely inexplicable effect on the string's behaviour.

EVERYWHERE ELSE

The **EveryWhere* command let loose on the unsuspecting world last month is currently back in shop undergoing some fine tuning. We hope to bring you the new version soon. In the meantime, here's a practical application of the utility. **ChangeType* is an obey file that allows the type of a set of files to be changed to another type. Although changing sprite files to Templates is not, on the whole, useful, changing eight-bit Basic programs to official Archimedes type Basic is. This led to the creation of **ChangeType*. As load addresses are not generally needed by Risc OS, it stores the file type in bits eight to 19 inclusive of the load address. A Basic program saved on an eight-bit machine has a load address of say &FFFF1900. Such a file will appear to Risc OS to be of type &F19. To change it to



JIGGLE IT, QUITE A LOT

Basic you would normally use:

**SetType <file> Basic.*

**ChangeType* takes three parameters: a directory name and two file types. All files of type 1 within the given directory are changed to type 2. So, to change all eight-bit Basic files to Archimedes Basic files in directory \$.Progs you could use:

**ChangeType \$.Progs &F19 Basic* and save yourself a lot of

trouble. We suggest you create an Obey file with *Edit*, enter the command:

EveryWhere -r %0 -t %1

-c "SetType %0 %2" -v

and save it as *%.ChangeType*. Note that we have assumed that you have made the necessary changes to *EverySrc* to allow the Root keyword instead of Directory. Please read the Biggest and Best item above for further details.

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*HELP

BBC Another bug has come to light in Chris Ruseman's *PicList* application. **B+** **M** **C** **A** ***** Elwyn Morris has discovered that if a drawfile contains a font that cannot be found, *PicList* locks up! The correction is to simply change the SYS on line 8320 to SYS "XFont_FindFont". The X prevents an immediate error, and allows PROText to exit harmlessly. Any text in this unknown font will not be shown.

Until two days ago, we had often wondered what the Look option to *COPY was actually for. The newer option ensures that files are not overwritten by older copies and this, on the face of it, would make the L option redundant. However even if a file is not ultimately copied, because a newer version is already there, it is still brought into memory only to be discarded! Copying from floppy to hard disc, say, can take a very long time even if no files are actually moved.

But if the L flag is used as well, *COPY will check the date of any existing files and will only physically move anything if it has to, thus saving time and disc wear.

*QUIT

Once a month we are woken by a sinister knock on the door of our humble abode. Manhandled by the BAU goblins, we are incarcerated in the Redwood Dungeon where we are forced to write these sagacious pages. Few realise the horror of converting 32-bit programs to run on Electrons. But you can help. It's not your money we require - indeed, you may well earn a reward from the Redwood coffers. It is code we crave - programs for Beebs and Arcs alike. Large applications, one-line games, hints, tips or even the merest hint of an idea which you think may lighten our burden.

All donations will be given the attention and financial reward they deserve, and the very best will find their way into these distinguished leaves.

Ideas are often more worthy of inclusion than their implementations, so fear not if you think your coding may be a little rosey. We have plenty of time in our Dungeon to tidy things up. So as the saying goes - Don't be iffy, put it in a Jiffy! We look forward to hearing from you...

Dave Lawrence, Dave Acton
Send your jiffies to *INFO, BBC Acorn User, Redwood Publishing, 20-26 Brunswick Place, London N1 6DJ. All

programs should be on disc and accompanied by a brief description of their purpose and operation.

COMPATIBILITY KEY

- B** BBC B compatible
- B+** BBC B+ compatible
- M** Master compatible
- C** Master Compact compatible
- E** Electron compatible
- A** Archimedes compatible
- *** BBC A3000 compatible

*INFO COMPATIBILITY TABLE

	BBC B	Master	Electron	Arc
Info 1a (MakeATS)	★	★	★	
Info 1b (Atoms8)	★	★	★	
Info 2a (Coral32)				★
Info 2b (Coral8)	★	★	★	
Info 3a (Biggest32)				★
Info 3b (Biggest8)	★	★	★	
Info 4a (LDPicArm)				★
Info 5a (Wave)				★
Info 6a (Fontboxes)				★
Info 7a (Localtest)				★
Info 8a (Jiggle)	★	★	★	★
Info 8b (EyeStrain!)	★	★	★	★
Info 8c (StringFncC)				★

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Here is your chance to learn
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NICK CRAIG-WOOD

HAVE A BALL

Just as musicians have musical notation, jugglers have the Cambridge Jugglers Association (CJA)'s juggling notation. A juggling pattern consists of a sequence of numbers t_1 to t_n . This is, in effect, a program telling a juggler how to juggle the pattern. The juggler has a metronome which ticks at regular intervals, and i counts the number of ticks so far. Here's how it works:

- At every tick, throw and catch a ball
- Throw from alternate hands
- When you come to throw a ball from a hand look at where you have got to in the pattern. For example, take t_i , you must throw the ball you have in that hand so it stays up in the air for t_i ticks
- If t_i was even then throw the ball to the same hand, otherwise throw it to the opposite hand
- If t_i is 2 then keep the ball in your hand for two ticks
- If you get to the end of the pattern, go back to the beginning. (If $i > n$ then $i = i - n$)

And that is all there is to it! Take a simple example, the pattern 5 1 (five one, not fifty one). To juggle this you would first throw a five throw with your right hand, then a one throw with your left hand. This brings you to the end of the pattern, so you repeat those two throws again and again. This leads to balls going in a high arc from right to left and in a low arc from left to right. It's the standard clown's juggle, three balls 'round in a circle' or to be technical, a three shower.

Here are some more facts about the juggling notation which, if you are mathematically inclined, you can prove:

- The number of balls in a pattern is the average of the numbers in a pattern. For example the average of 5 and 1 is three hence the three balls in the pattern
- For a pattern to be jugglable the following must hold. Take a pattern $t_1..t_n$ and add 1 to t_1 , 2 to t_2 etc. The pattern you are left with should consist of several different numbers.

This condition is equivalent to saying that you must only catch one ball at a time. This doesn't quite catch all possible un-jugglable patterns. If



Illustration by Paul Wearing

the largest t_i is bigger than the length of the pattern then it is necessary to use multiples of the pattern.

Some of the common patterns are:

Cascades: 1, 2, 3, 4, 5, 6, 7, 8, 9

Showers: 3 1, 5 1, 7 1, 9 1

Three ball patterns: 3, 4 2, 4 2 3, 4 4 1, 5 1, 6 0, 6 1 2, 5 0 4, 5 3 1, 4 4 4 0, 5 5 5 0 0, 5 0 5 0 5

Four ball patterns: 4, 5 5 2, 5 5 5 1, 5 3 4 4 4, 5 3 4, 5 3, 6 2, 5 5 5 5 0, 6 6 0, 6 3 3, 7 3 3 3, 7 1

Five ball patterns: 5, 9 1, 6 4, 7 4 7 (and more of increasing difficulty)

The notation cannot represent every possible pattern because it is essentially for a one handed juggler, and would require extending to cover two hands.

However, it covers quite a lot of the patterns people like to juggle. It can't cope with simultaneous throws from the left and right hand, throwing more than one ball at once from one hand (multiplex throws) or catching more than one ball at once.

THE PROGRAM

The program is a super efficient juggler which can juggle any valid pattern. It was originally designed on an Atari ST to help me learn how to do the particularly mind stretching patterns (like 5 3 4). It works exactly like the description of the patterns above, except that it has been refined for realism.

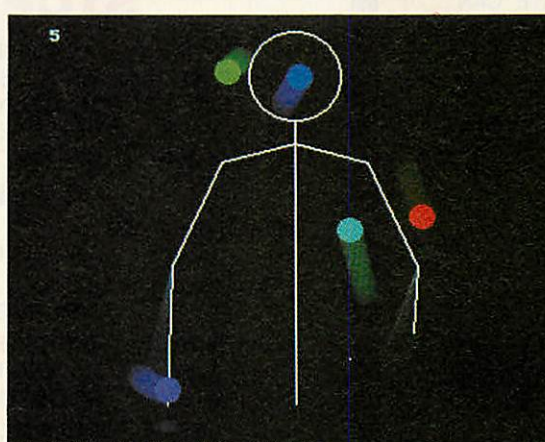
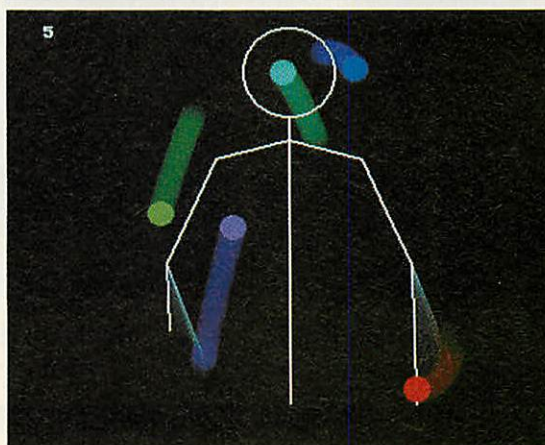
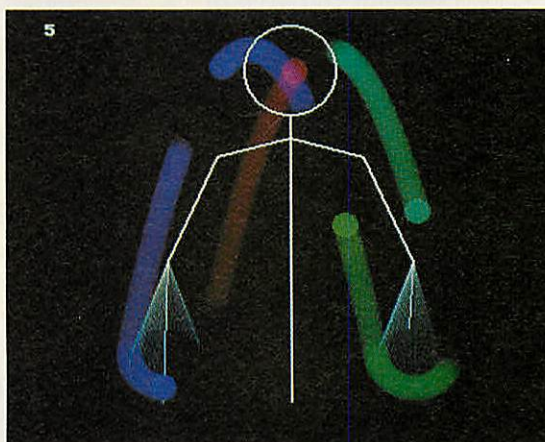
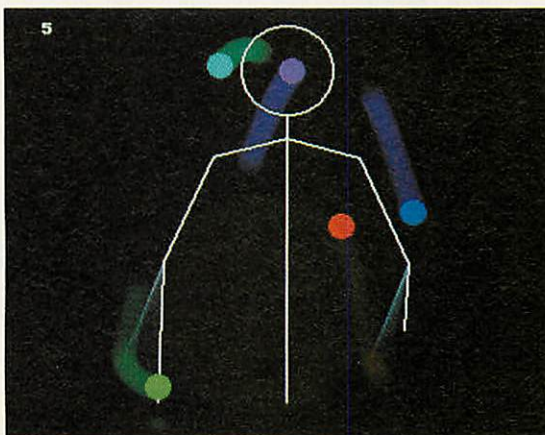
First each ball is held in the hand for one tick of the metronome while being thrown, and the hands go round in small circles. This is roughly how people really juggle. The one throw is a bit different, to make it realistic. In practice, people tend to pass the one throws between the hands, so the program alters the timing to make it look more like this.

Here is a brief description of how the Arc version works; the BBC version works in a similar way, but is converted to machine code for speed. The program is in three main parts.

PROCgetpattern gets the pattern from the user, and applies a few checks to it. If the pattern length is odd, this makes it even by doubling it. This is because an odd length pattern swaps sides every pattern repeat which would be no good for storing trajectories.

The pattern is then checked to ensure it is for a whole number of balls and that it is jugglable (by the criteria mentioned above). Finally the scaling for the height of the highest throw in the pattern is done.

PROCtrack makes the trajectories for the hands into `handx%()`, `handy%()`. This



MEET YOUR JUGGLING TUTOR

is so that you know where to land the balls and have them carried by the hands. The hands go round in circles at a half a revolution per tick.

Next the PROC makes the tracks of the balls into `trackx%()`, `tracky%()`. If a height h throw is dictated by the pattern, the program makes the ball follow the throwing hand for a half a tick then a parabolic arc for $h-1$ ticks with height proportional to $(h-1)^2$, and then the catching hand for a half a tick.

When the throw is a two throw the ball never leaves the hand, and when it is a one throw it goes straight to the other hand, with a parabolic arc for one tick. Purists may disagree with this modification; it makes 3 1 look a little odd, but that is how people learn to juggle it!

PROCjuggle uses PROCtickjuggle which juggles the balls for a whole tick. This uses a straightforward double buffered screen to do the animation. The only tricky part in this is starting the pattern off. The balls appear by magic in the juggler's hand when they are ready for the off.

HOW TO JUGGLE

Half the battle in learning to juggle is having a coach. So now that you have a perfect juggler to imitate, here follows a short course in how to juggle three to five balls. First find somewhere to practise, and something to practise with. Tennis balls are less than ideal as they are too light, and a bit too big for smaller hands. Rubber balls – but not the solid rubber type – are quite good but they do tend to bounce all over the place. Probably the best thing to juggle with is a set of beanbags. It is easy to make some cubical ones filled with rice or sand, or you can buy some juggling bean bags at any reputable juggling shop. Over your bed is a good place to practise, or in the garden, but preferably not too near anything breakable.

When you are learning a new pattern count the catches you make to get some idea of how well you are doing. The CJA says that you can 'do' a pattern if you can make 100 catches. However the IJA measures it differently, as two rotations of the pattern (ie, 14 catches for seven balls).

Always learn each pattern with both hands. For instance when you learn how to juggle two balls in one hand, if you are right-handed make sure you learn to do it competently with your left hand as well.

If you get stuck in a groove alter

ARCHIMEDES

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your pattern. Start with your other hand, or pitch your throws higher or lower. If this doesn't work practise something else. Everyone gets stuck at some time when learning to juggle a new pattern. It is to do with the way the hind-brain learns new patterns, so expect it and try not to wear the groove too deep, otherwise you will have learnt a bad habit. A typical groove is stopping after four catches of three balls. It's just psychological, so carry on juggling!

If your pattern is going wrong, but you can still keep on juggling, then juggle. You will learn more by trying to keep juggling when it is going wrong, than by catching the balls and starting again. While learning to juggle three balls make sure you end by dropping all, or at least two, of the balls and not by catching all three. That can be learnt at a later stage, and will prove too difficult at this point.

To juggle three balls, learn the following patterns in roughly this order:

3 0 0: This is tossing one ball from hand to hand. It is quite important, so watch the program carefully. You throw on the inside and catch on the outside, in a distorted figure of eight. Ignore the program waving its hands around in circles; you don't have to do that! Throw the balls at a height you feel comfortable with, usually about head height. Do experiment! If you throw the balls higher you have more time, but less accuracy. It is a matter of compromise. Always watch the top of the arc of the ball, don't watch it landing in your hands.

3 3 0 2: This is the crucial bit in learning three balls. It consists of throwing (say) a ball from your right hand, then a ball from your left hand, catching one in your left hand and catching one in your right hand, in that order. Once you can do it one way round, learn how to do it the other way round (2 3 3 0). You will be doing this 'cross' all the time when you have mastered three balls. Make sure you get the balls to the same height each time. Ignore the program whirling a ball around in its hand! If you want to slow this bit down then add an even number of 2's onto the end of the pattern.

3 3 0: This is the previous pattern done one way round then the other way round. Some people find this more difficult than three balls, but it is worth practising.

3: Just go for it! If you get stuck in a routine try altering your pattern by throwing the first ball with your other hand, or throwing the balls higher or lower. (If you throw too high your pattern will look like 5 2 2). Make sure all the balls go to the same height, and that the slaps of the balls landing in your hands are making an even rhythm. Everyone I have ever taught ends

up running across the room after their balls.

This is because (I think) that we have been conditioned to throw balls forward all our lives. You will stop doing this eventually; juggling in front of a wall may help. When you get really good at three balls, practise not looking at them. The pattern will become transparent – this

sounds odd, but you will understand what I mean when it happens. At this point the pattern is now entirely being done by your hind-brain, and you can use your fore-brain for anything you like (like speaking or watching TV). If you practise enough you will be able to juggle with your eyes closed. How to juggle four balls: There are lots of different ways to juggle four balls, but here is the easiest. First learn to juggle two balls in one hand (4 0) then learn to juggle two balls in the other hand (0 4). Now learn 4 4 4 0 (four with a hole). Some people find 4 4 1 helpful. Now learn 4 4 0 4, and then finally 4. Some other ways of juggling four are (roughly in order of difficulty) 5 3, 5 5 2, 5 5 5 1, 5 5 5 5 0, 7 1. You can put a 5 3 in 4 wherever you like. This gives rise to 5 3, 5 3 4, 5 3 4 4, 5 3 4 4 etc. Learn to juggle 5 3 by putting it in 4. There are many other sequences like that, for example 6 2 in 4, 6 3 3 in 4, 7 3 3 3 in 4, 4 2 in 3, 6 4 in 5. Use the program to experiment, and find other patterns to juggle. Juggling five balls is a lot more difficult than juggling four or three. It takes a lot of practise (say six months on average) but if you persevere with a little every day then you will make it in the end. Learn to do these patterns: 5 1, 1 5, 5 5 5 0 0, 5 0 5 0 5, 5 5 2, 5 5 5 1, 5 5 5 5 0, 5. Keep your

pattern wide enough. If you ever manage to do more than about 10 catches then you have broken the back of it – keep practising. If you want to juggle more than five, you are on your own. I knew a couple of people at Cambridge who could juggle seven balls and five clubs (not simultaneously!) so don't give up.

You can make up your own patterns, and a program to search them out wouldn't be too difficult to write. Juggling, I have found, is very good at combatting stress, so have a go! One final warning: juggling is addictive!

FURTHER INFORMATION

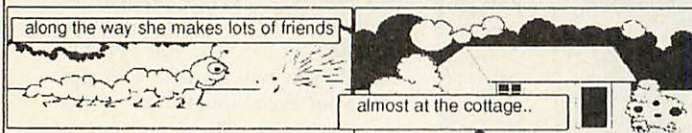
I only have one book on juggling and that is *Juggling with Finesse* by Kit Summers published by Finesse Press. ISBN 0-938981-00-5. It's full of wonderful photos, but the tricks are quite difficult to understand.

However, if you want to know anything about juggling, or buy loads more equipment, books etc, then I suggest you get a catalogue from: The Juggling Shop, 56 Islington Park St, London N1 1PX (071-354-5660).



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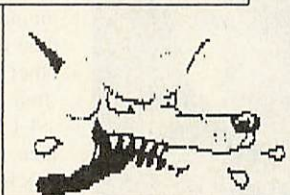


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DOING IT WITH DTP

Changing from a conventional publishing system – all scissors, paste and yards of galleys – to desktop publishing is a giant leap for a large magazine. Our decision to do it on the Archimedes made it a leap in the dark. But as the editorial team described last month, it has been a great success: the Arc is now a proven professional publishing platform. So how was it done? The problems boil down to two areas – consistency and compatibility.

COMPATIBILITY

For many desktop publishers in schools, colleges or at home, the compatibility problems of desktop publishing are this – 'How can I turn my *Impression* files into the bromide or film required by the printer?'

For quality results, laser printer output just isn't good enough. And you might want a page bigger than A4, which you can't print on your printer. *BBC Acorn User* uses Computer Concepts' Laserdirect printers for proofing in-house, but requires larger-than-A4 bromide and film to be made for the final printing stage.

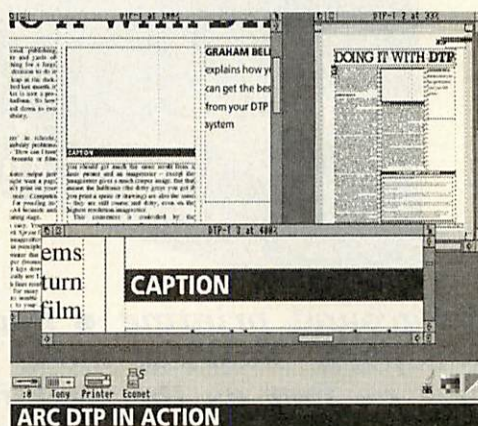
In the Macintosh world, it's easy. You send your Aldus *Pagemaker* or *Quark Xpress* files to an imagesetter bureau. An imagesetter, with its attendant Postscript RIP, is, in principle, little more than a precision laser printer that prints directly onto photographic paper (bromide) or film. But where a laser printer lays down 300 dots per inch, imagesetters typically use 1200 or 2400 dots per inch, giving much finer results.

This simple scheme is fine for many documents, but it can lead you into trouble if, for example, you add extra fonts to your Archimedes, you want to use paper bigger than A4 or you use any graphics in your documents.

The Postscript printing works by associating each of your Archimedes outline fonts with a similar Postscript font, so Homerton is linked to Helvetica, Trinity to Times and so on. These linked fonts must be compatible – the letters must be the same and must have the same width. Many Archimedes fonts are compatible, but some of the more decorative examples are not. Acorn, Beebug, Computer Concepts and Electronic Font Foundry provide a range of compatible fonts. Each new font requires two alterations in the file PSprolog which is inside the *PrinterPS* application directory, and new fonts come either with a new PSprolog file or instructions for changing your original.

Computer Concepts' *Expression PS* can help out with this – it automatically associates your Archimedes fonts with their Postscript equivalents, saving you the trouble of altering PSprolog. But none of this is any help if the bureau doesn't own the Postscript equivalent for the Arc font you want. So check that the bureau has every font you want – it could cost an extra £150 to £200 to buy a Postscript font.

Graphics are a separate problem. Postscript is a 'resolution-independent' graphics language, so



ARC DTP IN ACTION

you should get much the same result from a laser printer and an imagesetter – except the imagesetter gives a much crisper image. But that means the halftones – the dotty greys you get if you print a sprite or drawing – are also the same, still coarse and dotty, even on the highest resolution imagesetter.

This coarseness is controlled by the screening frequency, usually measured in lines per inch. *PrinterPS* sets this to 60, giving the familiar coarse dotted patterns. If you're using an imagesetter for your output, you can change this frequency to 125, 133 or even 150 lines per inch, which will give much better results on drawings, scans and even grey type. Again, *Expression PS* is the most convenient way of setting the screening frequency.

The finest frequency you can use depends on the printing press and paper you intend to use, so take advice from your printer. *Expression PS* also allows you to set the paper to anything up to tabloid size – though again check with your bureau the maximum width of its output, as many can't print anything wider than 300mm – and that's not quite enough for A3 output with crop marks).

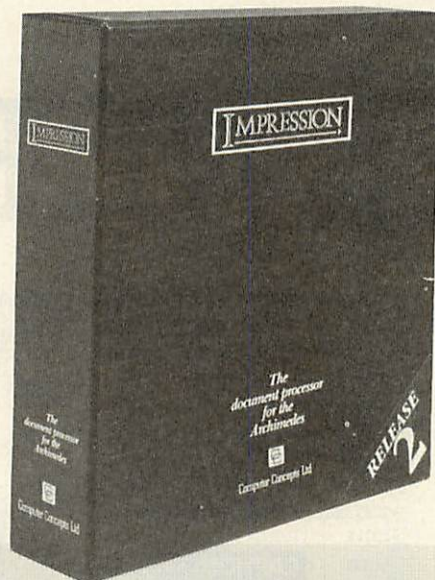
GRAHAM BELL

explains how you can get the best from your DTP system

DTP FILE TRANSFER MADE SIMPLE

- Load *Impression* and your document.
- Load *PrinterPS*, the Postscript printer driver, and use the menu to set it to print to a file rather than the parallel or serial port. The file name could be something like 'adfs::4.\$\$.page6/ps'.
- Print the *Impression* document. This creates a file called 'page6/ps' on your disc. The file contains the Postscript commands for printing the page – you can look at them by loading the file into Edit.
- Use Minerva's PC Access or PC Dir from Norwich Careware to transfer the file to a PC-format 720K floppy disc. PC Access has the advantage that you can format these 720K PC discs on your Arc.
- Take the 720K PC disc to your bureau. Apple Macintoshes can read PC discs using applications like Apple File Exchange or Dayna Dos Mounter, and the file can be downloaded to the imagesetter using Font Downloader or its equivalent.

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FIRST SCREENING

JOHN ROBINSON broadens your mind with this clever program for your monitor and Beeb

How often have you wished that you could use more than the normal 72 characters you get in *View*? Wouldn't it be nice to see a bit more of that spreadsheet you're working on? Well, here's a simple solution. Normally the widest screen provided by the BBC is 80 characters wide. With this program, you can increase this to as wide as your monitor will display. You will, however, lose a few lines of the display. This is because the maximum screen length that the hardware will work with is 20K. Type in the source code on the yellow pages, and save it out of the way somewhere. Now run it. It will save a file called *Wide102*.

Type **Wide102* to get the routine going. If you find that 102 characters is too wide or too narrow, delete *Wide102*, press **BREAK**, change the number in line 180, and run the program again. Repeat this process until you find a width which suits your monitor. Don't run the routine twice – the machine will hang until you press **BREAK** if you do.

Run the program again to save onto your utility disc, or into your library. The program works out the maximum number of lines possible for that width. The most efficient widths (ie, those which waste the least memory) are 94, 98, 102, 106, 111 and 117 characters. The routine will also provide a wider version of mode 4 – half the width of mode 0.

The routine works by trapping the operating system VDU control routine *OSWRCH*, and setting up the extra-wide screen mode when you select mode 0 or mode 4. It starts at *.init_start* by checking that the user hasn't added any parameters to the command, because the command doesn't need any parameters, and if it didn't display an error, that would imply that it had accepted the parameters.

At *.no_bad_syntax* the routine saves the contents of the *OSWRCH* vector and puts in its own entry address. This means the routine is called every time *OSWRCH* is called, and it can use the original *OSWRCH* when necessary. Then it selects the new mode 0. When *OSWRCH* is called the routine is entered at *.newwrch*. It checks at *.checknewmode* to see if a VDU 22 has been issued – the VDU command for *MODE*.

If one has been issued, it sets a flag to change mode the next time a VDU command is issued – the next command will be the mode number. If it wasn't a VDU 22 command, it just passes the command on to the OS at the original contents of the *WRCH* vector.

When a VDU 22 is issued, the routine takes the next VDU command to be the mode number. At line 1160 of the source, the routine executes the command as normal, then checks to see if a new mode is required. If it wasn't a new mode that was selected, the routine goes back to the OS as

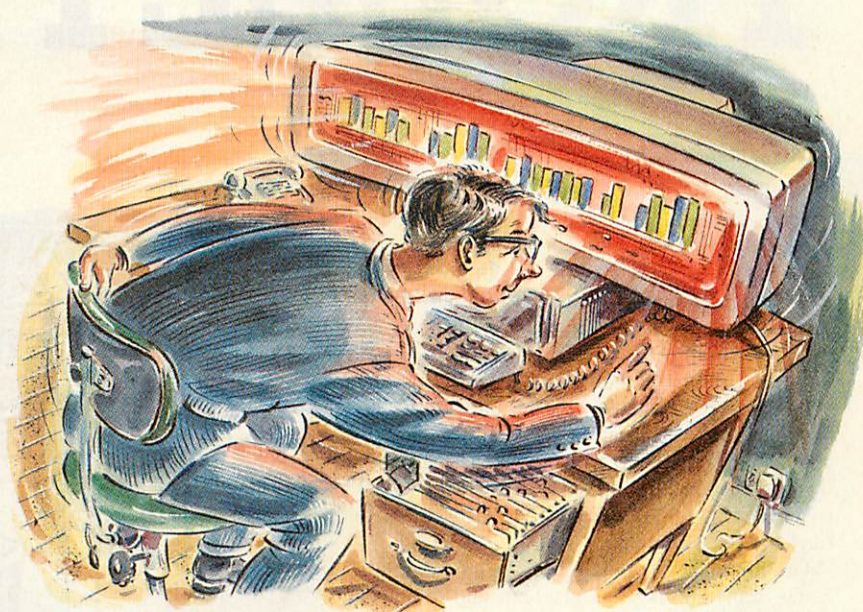


Illustration by Gary Wing

usual. The most important part of the whole program is the part which actually sets up the new modes. This bit starts at *.setUpXtraWide*. Obviously it is necessary to manipulate the video hardware. All the manipulation is done using the 6845 CRTC chip, by changing the contents of its registers. The table below shows how each register should be changed to give the new mode 0 display.

This routine has been tested and found to work with *View*, *Viewsheet* and the Basic Editor. The routine hasn't been tested with the *Inter* series because it has its own wide display modes. It doesn't work on a Master at all, however, because of the absence of the pointer at *&EO*.

Well, I hope you find the program as useful as I frequently do.

THE 6845 CRTC REGISTERS

Number	Description	Mode 0	Wide mode 0	Comment
0	Total width	127	unchanged	The monitor is the same width
1	Displayed width	80	new width	Want to display full width
2	Horiz sync position	98	57+new width/2	To centre display on monitor
3	Sync width	828	unchanged	The monitor is the same width
4	Total height	38	34	It complains if you don't do this
5	Vertical sync adjust	*TVx	0 (done with *TV)	
6	Displayed height	32	&A00/newwidth	Fewer lines now
7	Vertical sync posn.	34	&500/new width+18	To centre display on monitor
8	Interlace and delay	*TVn,x	0(done with *TV)	Without interlace only
9	Scan lines per char	7	8(adds a space)	Works better, and more pleasantly
10	Cursor start	8	unchanged	
11	Cursor end	8	unchanged	
12,13	Memory pointer	changes	same	All the other registers are left
14,15	Cursor pointer	changes	same	Up to the OS to set and change as
16,17	Light pen pointer	changes	same	it thinks fit, from the data in page 3

OFF YOUR TROLLEY

Buy some time with **DAVE LAWRENCE's** fuss-free shopping list program

A number of months ago I was wandering around Sainsburys, idly threatening little old ladies with my appalling trolley control, trying to remember whether or not we needed mixed beans. Yet again I had left that all-important shopping list, written on the back of an envelope, on the kitchen table.

When I got home and consulted the list, sure enough I had written down mixed beans. However on careful inspection of the bottom cupboard not only did I unearth two emergency tins, but I also discovered that we were out of spaghetti and that once again we'd forgotten to buy chopped tomatoes.

On my next shopping trip I fared slightly better, remembering the spaghetti and tomatoes and even deliberately passing the mixed beans. Then, while standing in the checkout queue thinking how much more interesting the shopping of the person in front looked, I had an idea – to build-up a specialised database to keep track of what I buy and when I buy it. It would then be able to carry out a bit of detective work on the data, and produce a shopping list based on how long it usually takes me to eat my way through each item. I got a bit carried away and almost wrote to Mr Sainsbury to ask if he could supply till receipts on 800K ADFS discs. A more realistic proposal would be to scan in the paper receipt and perform a little OCR.

Having determined what was needed I set about writing the program. The finished listing, *Trolley*, can be found on the yellow pages. The program works in mode 7 so it will not work on an Electron. It is, however, Basic 5 compatible and will work on an Archimedes or A3000, albeit in emulated mode 7. A Risc OS version is in the pipeline and should appear in *BAU* soon.

USING THE PROGRAM

The program first needs to find out the day's date. Masters and Arcs will read this from the real time clock using the *TIMES* pseudo variable. On other machines it attempts to find the date in a file called *Date*. If this is not present it will assume a default of January 1 1991. In either case you will be invited to enter the correct date using the left and right cursor keys. Pressing **SHIFT** will speed up the date movement, and **RETURN** will enter the date and save it in the *Date* file ready for use the next time.

The program's menu will then appear. The purpose of the menu options should be self explanatory. In addition to the keys shown you



Illustration by Angela Wood

can use **ESCAPE** to enter Edit mode. As you have not yet entered any data you will not be able to save a file or produce a list, so you'll have to choose Edit list and type some in. you'll only be able to do this if you've just been shopping and have a list of the things you've bought.

ENTERING DATA

Edit mode consists of a scrollable list of all the items you have bought, arranged with the most frequently bought objects at the top. The first 10 are labelled **F0** to **F9** for quick access, and the last one is marked **=>**, being the place where you type in new items. The list is scrolled with the

Shopping list
Mixed Beans
Spaghetti
Chopped Cheese
Coffee

up and down cursor keys. In addition, CTRL-UP will take you to the top of the list and CTRL-DOWN to the bottom, where you enter any new items. To enter a new item simply type in its name and press RETURN. This will create a new => slot below and move the cursor there. To alter the name of an existing item, highlight it with the cursor and press RETURN. To exit from Edit mode press RETURN again.

Typing in names does just that. It will not register a purchase. To tell the program you have actually bought something, highlight the item with the cursor and press a number between one and nine, depending on the quantity you bought. Numbers higher than nine and less than 254 can be entered using the + and - keys. If you mistakenly enter a quantity for an item you didn't buy, press DELETE to remove the number. Once you have told the computer all the things you have bought, press ESCAPE to leave the list editor and save your file. As you will have typed your data in from scratch a default filename will be given. This can be removed by pressing CTRL-U and a sensible name inserted - I call my list DL's. Before the file is saved the data is sorted. As this can take a while, it tells you what it is doing at the bottom of the screen.

I'm afraid that that's all you can do for now. To produce a shopping list the program needs at least two sets of data, so you'll just have to go shopping again and enter some more data before reading on!

PRODUCING A LIST

If you've been using *Trolley* for a couple of weeks, religiously telling it all the things you have bought, you will now be able to use the Produce list option. This will first prompt you for a file name to save the list under. However a default name, based on the day's date, is provided in case you can't be bothered to think of one yourself.

At this stage there are a number of special options - if you give it either an empty string or VDU: the list will be displayed on the screen. Alternatively, PRINTER: can be used to provide a hard copy. In any case the date and name of the list file eg, DL's, will be output along with a list of items the program thinks you might need. I'll explain how this works below. You can now use this as a basis for your actual shopping list.

When you get back from the shops, run the program again and enter all the things that you bought. There is however one unwritten rule about producing lists and that is that you must give the program information about all the things it suggested you should get, even if you didn't actually purchase them all. For example, if you still had some of that item left in stock and didn't buy any more you should enter X instead of a quantity for that particular item. The only exception to this is if you meant to buy an item but couldn't because they'd sold out or you just forgot. In this case don't enter any quantity

ITALIAN DRESSING	0.79
POTATOES 2KG	
REDUCED PRICE	0.69
POTATOES 2KG	
REDUCED PRICE	0.69
JS SWEET CORN	0.33
JS TUNA SKIPJAK	0.53
FELIX TRUT/SHRMP	0.36
TINNED TOMATOES	0.21
FELIX BEEF	0.36
FELIX TRUT/SHRMP	0.36
FELIX TUNA	0.36
MISC PEELD TONS	0.39
JS TUNA SKIPJAK	0.39
JS SWEETCORN	0.38
FELIX DUCK/HEART	0.36
FELIX RABBIT	0.36
FELIX CHICKEN	0.36
TINNED TOMATOES	0.21
TINNED TOMATOES	0.21
JS SWEET CORN	0.33
TINNED TOMATOES	0.21
JS BAKED BEANS	0.27
JS SWEETCORN	0.38
WHOLE BEANS	1.19
W/MEAL SLD BREAD	0.70
CHOC DIGSTV BARS	0.49
JS SOUP IN CUPX4	0.68
ORAL B T/BRUSH	1.42
JS CHEESE S/WICH	0.39
BANANAS	
1.14 1b @ £0.59/1b	0.67
SPAG IN TOM SCE	0.23
GRAPEFRUIT	0.28
GRANNY SMITH	
1.48 1b @ £0.59/1b	0.87
JS JACKET CRISPS	0.97
HULA HOOPS X10	1.29
ONIONS	
2.56 1b @ £0.45/1b	1.15
JS S.FLOWER MARC	0.63
JS F/RANGE EGGS	0.89
JS BLEND BUTTER	
4 @ £0.54	2.16
JS SNAX	0.49
JS F/HOUSE CHEDD	2.42
JS D/GLOUCESTER	0.85
JS F/HOUSE CHEDD	2.50
JS FILTER COFFEE	1.67
JS JACKET CRISPS	0.97
W/MEAL SLD BREAD	0.70
MUSHROOMS	
1.14 1b @ £1.40/1b	1.60
JS FILTER COFFEE	1.67
TOMATOES	
1.43 1b @ £0.52/1b	0.74
WHOLE CUCUMBER	0.55
PINEAPPLES	0.50
COURGETTES	
1.26 1b @ £0.49/1b	0.62
JS GRAPES LOOSE	
0.69 1b @ £1.08/1b	0.75
SOFT MINTS X 3	0.60
GREEN PEPPERS	
0.43 1b @ £1.09/1b	0.47
CARROTS	
2.36 1b @ £0.35/1b	0.83
CAULIFLOWER	0.75
ICEBERG LETTUCE	0.65
76 BAL DUE	83.38
CHEQUE	83.38
CHANGE	0.00
417 24 108 9119 17:46 17JUN91	

into the list editor. The program will remind you to get some next time!

And that's all there is to it - just remember to use the program to produce a list each time you shop and ensure you enter all the things you bought when you return. If you do use the program a lot, you may like to change the default name supplied to the file load option. This is the list variable in line 60.

HOW IT WORKS

The data is stored as Ascii characters in the file. Each item is named and has a counter for the total number of times it has been bought. There is an additional list of dates and quantities for the last few times the item has been purchased. The actual number is controlled by the maxslots variable in PROCinit. When a file is loaded this data is converted into a 96 byte record containing the same information but in a machine-readable form. Most of the program is taken up by the editor. The actual list production is handled by PROClist and PROCcalculate at the very end of the program.

PROClist examines each item in your list and if there are two or more date entries for it it calls PROCcalculate; no predictions can be made if you've only bought something once. PROCcalculate does all the dirty work, calculating the period between the first time you bought the item and the most recent. It then adds up the total quantity bought within that period, not including the number bought on your most recent shopping trip. From this it can calculate how long, on average, it takes to consume one item. It multiplies this time by the number of items bought on your last trip to work out, as best it can, how long these will last. This time is added on to the date of your last trip to come up with a date of when it thinks you will probably run out.

A second period is calculated which ignores any trips where you did not buy the item ie, where you entered X in the list. This is divided by the numbr of trips made in that period, to calculate the average duration between purchases for the item. If the run out date falls before today plus half the average period then the program reminds you to replace it. Originally I did not add on this average, but the program then only reminded me when it was too late! Adding the whole average on causes a reminder if you go shopping at any point mid-week. This became annoying if you were just going shopping the next day because you'd forgotten a few things. Adding half the average is therefore a compromise which seems to work reasonably well.

The higher the value of maxslots the longer the program will remind you to buy things even if you don't need them. Eventually all the quantities stored will become zero and the program will forget about that item.

I've not been able to exhaustively test the program, but it does seem to give the expected results. I'd be very interested to hear from anyone who uses the program seriously and also if anyone can verify that the algorithm outlined above is indeed correct!

WISE WORDS

You may think you know how to use a program, but are you using it properly? Software guru **PAUL JAMES** tells how you, too, can be a power user

You've learnt enough about the Desktop and Risc Os to be able to use any application now at its simplest level, which was the prime aim of our first series, First Steps. But using an application efficiently and to its full potential is another story.

This new series will put an individual application under the microscope and lead you through its more specialised functions, tell you what you can use it for, and perhaps help you how to get round a few problems that the application poses.

We begin with *1st Word Plus*. This application is best described as a word-processor – indeed that's what it is. Its main aim is to allow you to write letters or documents and print them out.

It is quite memory-hungry and is most at home on a machine with more than 1Mb of memory, as are most applications. However there is a simple bug in earlier versions of the application which means that when you run it all of the available memory is 'eaten'. This can be fixed quite simply by editing the *Run* file inside the application directory.

First of all load *Edit* then place your *1st Word Plus* backup disc in the drive. If you haven't got one then make one. Now hold down SHIFT and double click on the *1st Word Plus* application. A directory viewer will open showing all the files you have available.

Drag the file called *!Run* onto the *Edit* icon on the icon bar by holding down Select then moving the pointer while still holding the button, and letting go when the pointer is pointing at the *Edit* icon.

The *!Run* file is obeyed when you double

click on the application. It sets up some variables, particularly one that can be used to find out which disc the application is on, tells the computer how much memory the application needs, then runs the actual code that is the application. Newer versions of *1st Word Plus* will have been modified and if your version has then a short note at the top of the *!Run* file will say so. If not then you will have to modify it yourself.

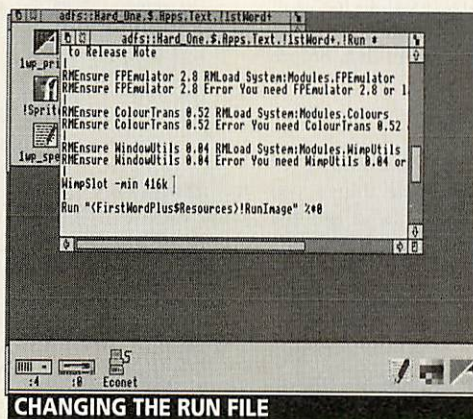
The line that tells the application how much memory it is allowed to claim is the one that begins *WimpSlot -min*. You will have to scroll the *Edit* window down to find it. If this line just reads *WimpSlot -min 416k* then this allows the application to take all the memory it can. Adding a *-max 608k* after the *-min 416k* tells *1st Word Plus* that it isn't allowed to take more than 608K.

Click on the *Edit* window and using the cursor keys to position the caret after the *-min 416k* then type the *-max* line.

Your line should now read *WimpSlot -min 416k -max 608k*. This clears up many problems experienced by owners of early versions of *1st Word Plus*, and makes it usable if you have only 1Mb of memory, but this is no excuse not to upgrade though.

Now re-save the edited *!Run* file by moving over the *Save* option and clicking on *OK*. Because you loaded it from disc *Edit* knows where to put the file so you don't need to drag it to a directory viewer. Close the directory viewer and quit *Edit*.

Load *1st Word Plus* and close the directory viewer. This can be done in one fell swoop by double clicking with *Adjust* on the filer icon for



CHANGING THE RUN FILE

PRACTICE TEXT

...in the case of this month's disc, this is fine for programs like *Trees* in the *INFO section, which will run straight away. But for the scrolling routine it is more of a problem.

You need to run the *MakeFont* program first which will save some data to the disc. As the disc arrives write-protected, this will cause an error – to use many of the programs on the Monthly Disc it is best to transfer them to another disc and run them from there, from Basic, not the desktop, as instructed above.

Listed here are some of the commands that will help you find your way around the monthly disc while in Basic...

the application. Bring up a *1st Word Plus* window by clicking on its icon on the icon bar.

The window is a bit more complicated than an *Edit* window. Most notable is the ruler, which has tab positions and margins marked on it. Now type in the three specimen paragraphs in the first box. Don't worry about mistakes – in fact make a couple of spelling mistakes on purpose. When you reach the end of a paragraph press RETURN twice.

Notice that when the cursor reaches the right margin, denoted by the 'J' character on the ruler, the word that you are typing is forced down to the next line. This is one of the main features of a wordprocessor and is the reason *Edit* can't be described as one, (when it reaches the end of a line, the cursor simply moves onto the next one and splits the word). This feature can be turned off, by unticking the Wordwrap option from the Edit submenu, but then you might just as well use *Edit*.

Put the cursor on the first line of the second paragraph and choose Add Ruler from the Layout submenu, an Add Ruler dialogue box will pop up. Don't worry about the options here for the moment, just click on OK. Now from the cursor downwards, to the bottom of the text or the next ruler, this new ruler takes effect on the text. You can add as many rulers as you like and moving the cursor across ruler boundaries will adjust the ruler display accordingly.

To alter the width of a ruler press and hold Select over the right hand margin character (the J). Drop it about half way along the ruler and let go of Select. This is now the right margin. To reformat your text to this margin place the cursor at the beginning of the paragraph and choose Reformat Paragraph from the Style submenu.

When you reformat text, *1st Word Plus* may try to hyphenate a word, but it will ask you first. You can move the hyphen left or right in the word with the arrow icons to the position where it looks best, then click on OK. If you don't want that word hyphenated then click on cancel. Click on Disable to turn hyphenation off completely, you can also do this from the Edit submenu.

'Soft' hyphens inserted by *1st Word Plus* to break words across lines, those which may well disappear when the text is reformatted are represented by tildes (~) on screen, but in print they

come out as ordinary hyphens. This is to distinguish them from hyphens you have inserted yourself in phrases such as 'single-line'.

You can position this margin more accurately by bringing up the Modify Ruler dialogue box. To do this double click on the little fork symbol at the far left of the ruler. Now you can make the ruler length exactly the number of characters you want by typing the value in the Ruler Length box, if you've got time to waste you could even use the arrow characters. Clicking on OK fixes the margin, now position the cursor at the start of the paragraph and choose Reformat Paragraph, or Reformat Whole Document.

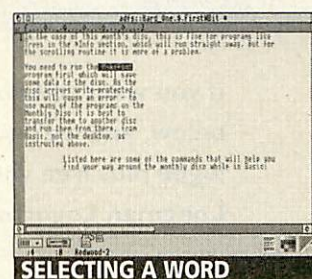
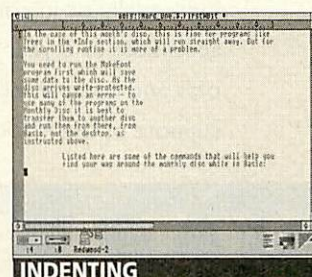
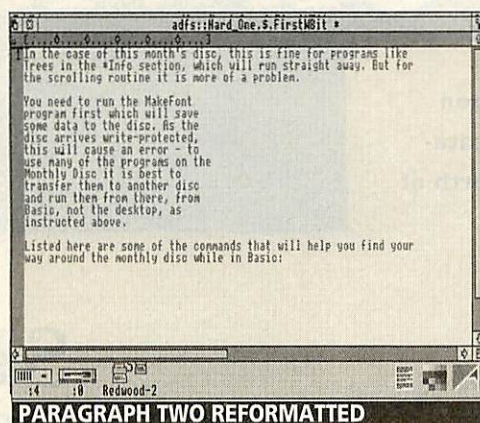
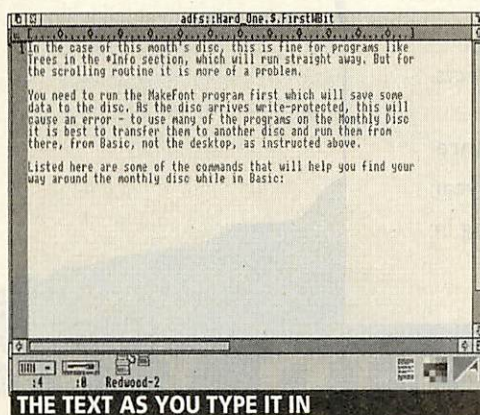
Try putting the cursor in the second paragraph and holding down Select over the fork symbol. A line will be shown down the left-hand side of the page, extending from the start of the current ruler to the end of it.

You can also adjust the left margin. Place the cursor at the beginning of the last paragraph and choose Add Ruler again. This time drag the left margin about 10 characters in. Now if you choose Reformat Paragraph the text will be indented.

Another feature of rulers is whether or not text is 'ragged right' or fully justified between them. Place the cursor at the beginning of the second paragraph and bring up the modify ruler dialogue box by double clicking on the fork symbol. Click the justify button on and click on OK. Now if you reformat the paragraph with F7 (the key shortcut for Reformat Paragraph) then the text will be fully justified, extra spaces are put between words to make up the width of the lines to the width of the ruler.

Tables can be laid out in *1st Word Plus* using the TAB key. Pressing it will insert spaces until the next tab character on the ruler is reached. You can alter the position of these characters by clicking Select on one to delete it, then clicking elsewhere along the ruler to place a new one. A quick way to delete all of the tabs is to pull the right margin across, let go of it, then pull it back.

Double clicking on a tab will turn it into a hash mark (#) which denotes a decimal tab. When you tab across to one of these anything you type will go to the left of the tab, until you press SPACE or FULL STOP or the text reaches any text or tab character before it. Since printers are capable of a great many effects, *1st Word Plus* is able to use these. Adding a style to an area of



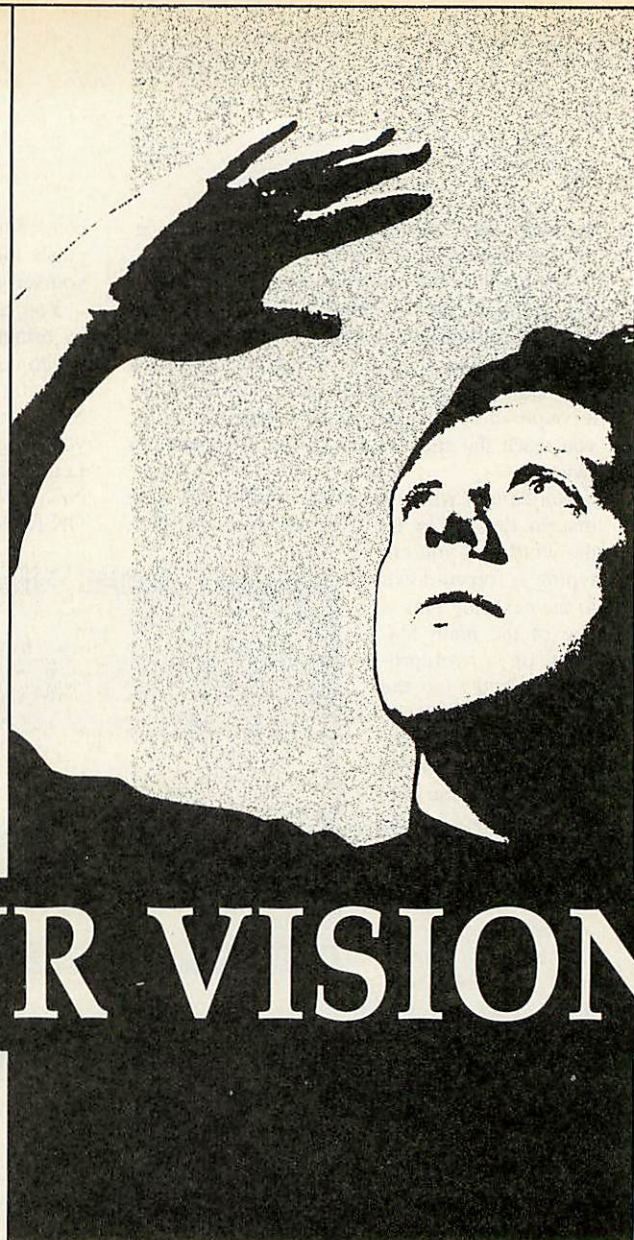
SPACED OUT

1st Word doesn't use normal spaces – instead it uses a special code for a space. So for the reformatting to work correctly when importing text into *1st word Plus* you must first change all of the spaces to this special code. This can be done in *Edit* by loading the text and choosing Find from the Edit submenu. In the Find box put a space and in the replace box type `^x1e`, make sure that the magic characters are turned on. Press RETURN then replace until 'End of File', now save your text into *1st Word Plus* and choose Reformat Whole Document from the Style menu.

If you haven't seen Longman Logotron's 1991 catalogue, chances are you aren't making the most of your school's software budget. Consider these brand new programs for the Acorn Archimedes:

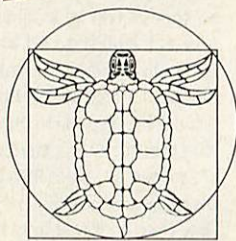
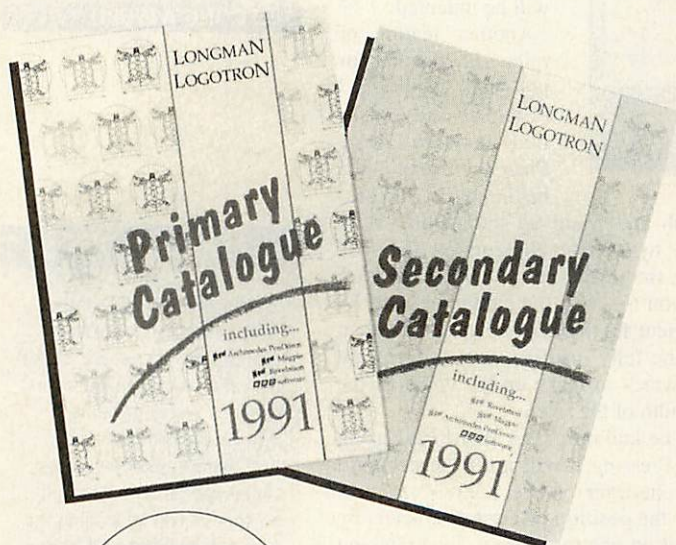
- **Pendown**, a word processor designed specifically for education, with a range of new features offering control as well as freedom
- **Revelation**, a powerful image processing program which enhances classroom creativity across the curriculum.
- **Magpie**, a multi-media publishing program which enables children to draw on a wide range of sources to create flexible and exciting projects.

Individually or in combination, these programs are accessible to 6 year olds, yet will challenge 16 year olds and open an expanding universe of learning in support of the National Curriculum.



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2. AW 5-91

text is as simple as selecting it, then choosing a style from the Style menu.

Press and hold Select on the *1* of *1st Word Plus* in your text. Then drag the pointer so the black area covers *1st Word Plus*. Now press Menu and move over the style submenu and click on Italic. The characters will adjust to show the style put on the text.

Press CTRL-UP to move to the top of the text and press Return twice to make two clear lines. Move back up to the top and type, 'some text from an article in bau', all in lower case. Now select this line and with Adjust choose Title Word, from the bottom of the Style submenu. This will capitalise all of the words. Also using Adjust choose Bold and Underline, and finally with Select choose Centre. That's how easy it is to add styles to your text.

A very important feature of a wordprocessor is the ability to know where page breaks occur, and to be able to add them yourself. If you click with Select in the grey margin on the left-hand side of the window you can add a page break. When printed, this page break will make *1st Word Plus* eject the rest of the current sheet of paper it's on and continue printing on the next page. To delete it click Select again.

1st Word Plus will automatically insert page breaks when it reaches the end of a page. These can be distinguished from those you put in because they have a small dotted line instead of a solid one. The page length is set up from the Page Layout dialogue box in the Layout submenu. A4 paper can fit 70 lines down the page, whereas computer fanfold paper fits 64.

Now is a good time to save your file – it's a good idea to do so regularly. Bring up a directory viewer of a blank formatted disc, press Menu over the *1st Word Plus* window and move over the File option in the Save submenu. Press CTRL-U to delete the standard filename and type in your own, something like MyText will do. Now drag the icon onto the directory viewer and the file will be saved. *1st Word Plus* now knows where to put this file and will save it when you click on OK in the future.

There's not much point in doing all this if you're not going to print out your document. *1st Word Plus* works in character mode, which means it uses the standard draft of your printer. Here lies a problem. Different printers have

different codes. For instance, a bold code on one printer might mean something completely different on another. For this reason several 'printer drivers' are included on the utilities disc.

Put the utilities disc into the drive and bring up its directory viewer by clicking on the floppy icon. Now open the IWP_Print folder and then the Config folder. Here are configuration modules for some printers. Your printer is probably Epson compatible so you'll need either the Epson_lq, Epson_lx or Epson_rx module.

To load a printer configuration press menu

over the *1st Word Plus* icon on the icon bar and choose Show Keypad. Now drag the printer configuration file onto the printer icon shown here. The device window will change to show you the new printer driver that has been installed. To check this printer driver is the correct one for your printer try printing out the PrintTest file in the IWP_docs folder on the program disc.

Make sure your printer is loaded and on-line, then simply drag this onto the printer icon in the keypad window. If all of the styles come out OK then this is the right driver for your printer, if none, or only some of the styles work then try another driver. Take a look at page 131 of your *1st Word Plus* manual for a description

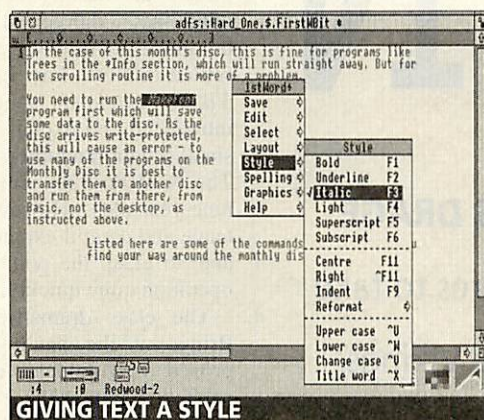
of which printer each driver is for.

Of course you may have a printer that doesn't feature in this list then you may need to make up your own. But this is a difficult and time-consuming job. In fact somebody has already done it for you. Norwich Computer Services sells a Careware disc full of such drivers.

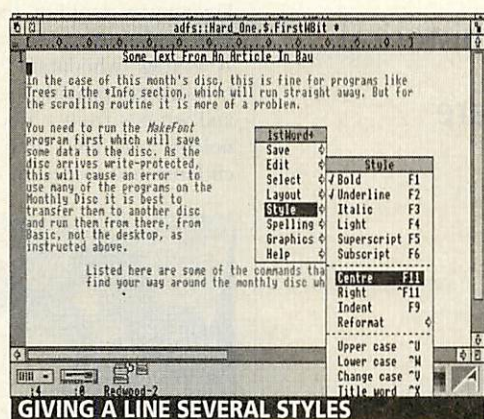
That's it for the first in the series. Now you know enough about *1st Word Plus* to be able to print out anything from your shopping list to a letter to the bank begging for more money, and if you get it to look good enough then they may well be impressed enough to give it to you!

COMPETITION

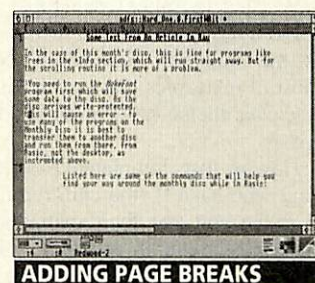
What application do you wish to see covered in this series of articles? Simply write this on the back of a postcard, together with what you use the application for most commonly and the first five out of the hat on 31 August 1991 will get a free BAU show ticket each. Send your postcards to: Stepping Up, BBC Acorn User, 20-26 Brunswick Place, London, N1 6DJ.



GIVING TEXT A STYLE



GIVING A LINE SEVERAL STYLES



ADDING PAGE BREAKS

EASY PRINTING

To save yourself the bother of having to load your printer's configuration file from the utilities disc every time you load *1st Word Plus*, it is possible to have it done automatically from within the application itself.

Set aside a Ram disc of around 32K and drag the printer configuration file into its directory viewer. Now open the *1st Word Plus* application directory by holding down SHIFT when double clicking on the icon. Drag the configuration file from the Ram disc to this new directory viewer, delete the file *1wp_print* and rename your printer's configuration file to this. Now this is the default printer driver.

SETTLE DOWN

During the second school term this year, my class of thirty Year 3 children prepared to do battle and tackle the Vikings – from within the relative safety of their classroom! At the time of planning my aim was to attempt History Study unit 2 which, as part of invaders and settlers, suggested the Vikings as a suitable subject for study at the year three level.

The topic also slotted neatly into my 'developing themes' approach this year where I have tried to splice each topic into the last as naturally as possible but within the framework of the National Curriculum. Not unnaturally, most of my topics this year have centred around a science theme (as science is a core curriculum area).

Having just completed Floating and Sinking (and who hasn't!) the children naturally wanted to make and test their own boats as they had completed several problem solving situations involving, for example, making 100g of plasticine float and carry a load. It was not difficult to introduce the Vikings from this angle as these people were excellent boat builders and using polystyrene meat trays, straws and paper, it is possible to make a fair replica of a longship.

The mere mention of the word 'Vikings' heightened the children's natural curiosity which was good as historical topics are frequently difficult to introduce to young children, being so remote in terms of time and divorced from the children's own experiences. The first task, as always, was to develop a suitable topic-web (see illustration) which plots the range of tasks and the development of themes.

The next task was to gather and assemble suitable resources with which to provide the necessary vicarious experiences. Important among the list of resource materials was computer software of both the content-based and content-free variety.

The first part of the study revolved around three major information sources: BBC TV's *ZigZag* programmes, Fernleaf Software's *Vikings Pack* and *Junior Projects No 34* (Scholastic Publications). The former stimulated a number of very interesting activities. As the first phase of any topic concerns information and image gathering, the *ZigZag* broadcasts were invaluable at providing visual imagery and motivating children to seek further knowledge. There is no

CHRIS DRAGE
prepares to take
on the Vikings,
with the help of
some historical
software

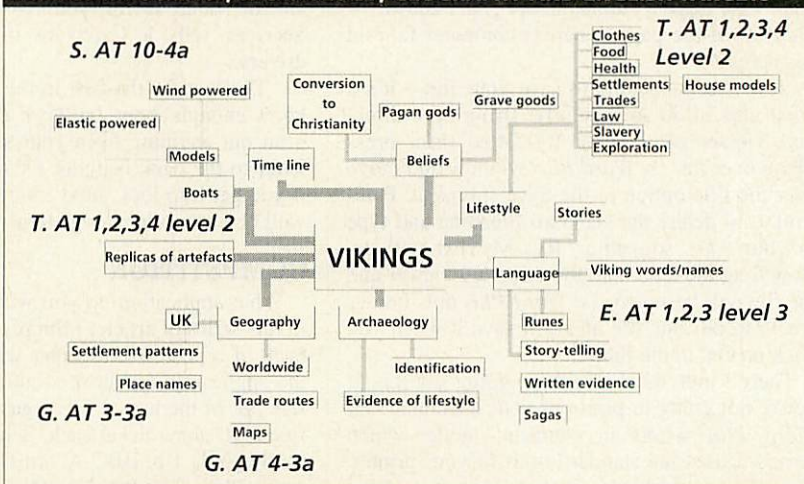
computer program anywhere (yet), that can substitute that most vital ingredient – direct experience. Unfortunately, these London children lived too far from what is regarded as the foremost Viking site, the Jorvik Centre at York, to permit a visit. However, this experience was substituted by a video of the Jorvik Viking Centre (included in Fernleaf's topic pack).

One of the first tasks was for the children to set about looking for evidence of Viking settlement in Britain by using place names on maps as a guide. On a map of England the children plotted the occurrence of place names ending with -by, -thorpe, -thwaite, etc. Slowly it became evident that the Vikings predominantly settled in North East England. At this point the *Viking England* simulation (Fernleaf) was introduced and explained to the children before small groups attempted the first program entitled *The Raiders*. This software is really suited to nine-year-olds. However, with teacher assistance and careful explanation, the children were able to grasp the point of the software and its operation quite quickly.

The class dramatised the fall of London Bridge at the hands of Viking raiders. This proved very popular and a large mural was painted depicting this event. In another activity, the children painted large scenes from the Viking legend of Thor's visit to the giants. The legend was retold by the children for the assembled school using their paintings as illustrations. A Viking 'whodunnit' play (part of the *ZigZag* broadcasts), provided an opportunity as to rights and wrongs from a Viking point of view. Technology was also brought into play when the children had to design and create model Viking



VIKINGS HIT SCIENCE, TECHNOLOGY, GEOGRAPHY AND ENGLISH TARGETS



longships from simple materials. The resulting models were each tested in a tank of water and given a timed run using a hair drier as a wind source. The results of the tests were described and recorded on charts and the reasons for success and failure discussed.

Here another item of software was brought into play. *Display Data* (Resource), enabled children to enter data into the computer and have it printed out in the form of a bar chart or pie chart. Software of this nature really enables children to grasp the significance of the computer as a tool in the classroom.

The latter part of this study involved the children working in groups of five or six on a variety of activities ranging from researching information from books, viewing slides to listening to a taped story and completing a sequencing exercise. Two of these group activities involved the classroom computers. I had created a short piece of text about the Vikings with the now familiar *Developing Tray* cloze procedure program.

The software requires the children to reconstruct the text from a series of dashes and less common letters. The program stimulates an amazing amount of discussion over strategies and the validity of predictions. A scratchpad can be used to check whether suggestions make sense, to test predictions and make notes. Although inter-group competition was actively discouraged, it soon became apparent that this activity was one of the most popular of those offered as groups vied to outdo each other on points.

Undoubtedly the most popular activity was the simulation offered by the *Viking England* suite. The children, now familiar with The Raiders were keen to continue with the second part of the suite – Journey's End. In this the children take on the leadership of a Viking party intent on settling in England. Decisions regarding the choice of site, the order in which various tasks, like setting up camp, must be completed, are integral to this part of the suite.

A valuable aspect of this software lies in the fact that children must choose other tasks they consider important apart from those offered by the program. The subsequent discussion revealed a great deal about the children's comprehension of the Vikings. The arrival of another party of Vikings who settle away from the children's 'group' provides opportunities for empathy mellowing the somewhat materialistic attitudes present in The Raiders. The children had to decide whether or not to co-exist peacefully with these strangers.

As a record of their work the children completed maps depicting the siting of their settlement. The teacher has access to a record of each group's decisions via a special teacher's page. The third and fourth parts of the suite, The Move and The Jarl, I judged to be too difficult for this Year 3 class.

When the classroom computers were not engaged in *Developing Tray* and *Viking England*, they were seldom idle as children used them continuously for wordprocessing and printing text, headings, captions and subtitles for their project books. *Pendown* and *Signwriter* (*Pendown Toolbox*) both from Logotron, are the



LONDON FALLS TO THE VIKINGS IN MURAL FORM

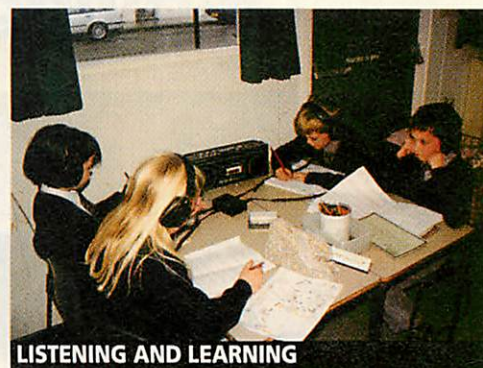
PRODUCT DETAILS

Viking England and the Vikings Resource Pack are available at £35.95 and £55.95 from Fernleaf Educational Software, Fernleaf House, 31 Old Road West, Gravesend, Kent DA11 0LH Tel: (0474) 359037, for the BBC B, B+, Master 128, Compact.

Display Data is available at £10.95 from Resource, Exeter Road, off Coventry Grove, Doncaster DN2 4PY. Tel: (0302) 340331, for the BBC B, B+, Master 128.

Pendown and Pendown Toolbox are available at £39 and £18 from Logotron, Dales Brewery, Gwydir Street, Cambridge, CB1 2LJ Tel: (0223) 323656, for the BBC B, B+, Master 128, Compact. (Archimedes Pendown also available).

Developing Tray is available free of charge from your local authority computing centre.

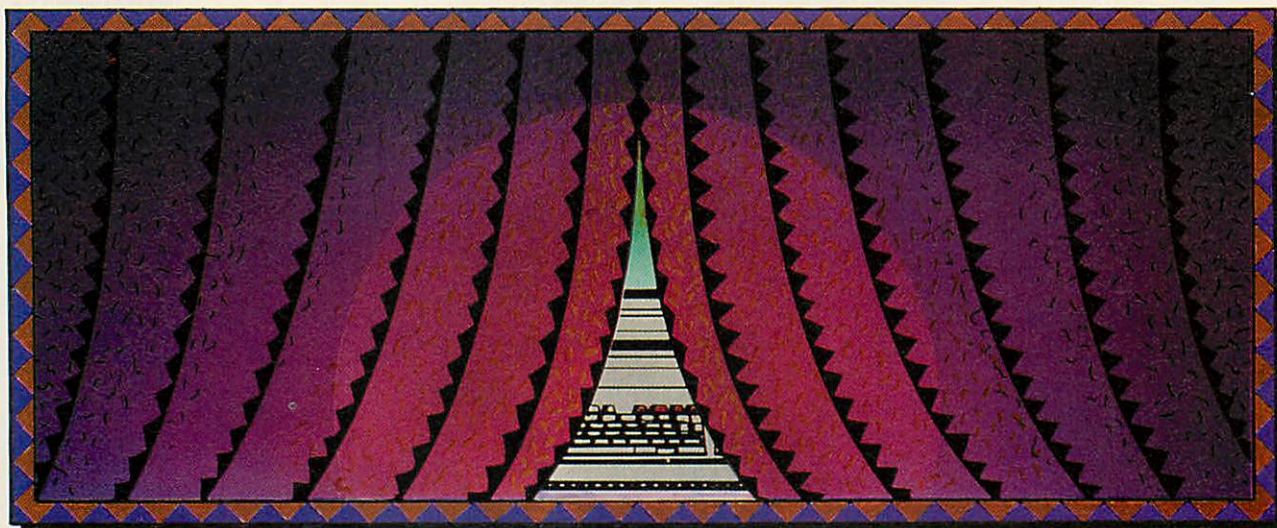


LISTENING AND LEARNING

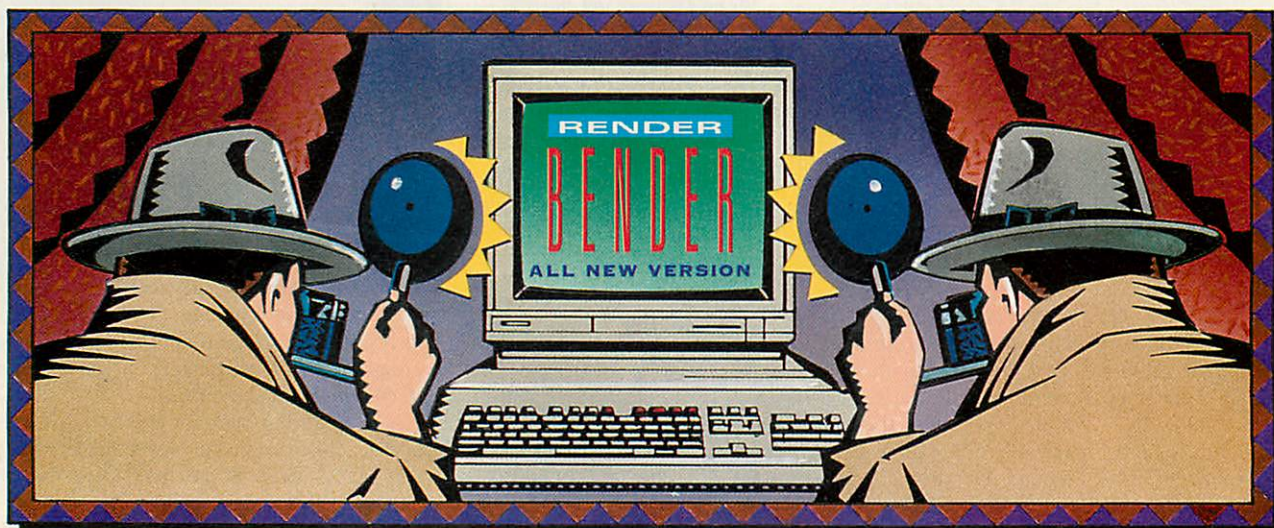
standard tools in this class. The children really appreciate the various fonts and sizes the software produces on the printer. These are then cut out, coloured in and mounted.

To say that the children gained a great deal from this historical study is to understate the case. Many voted it the best topic they had completed this year while others were so enthusiastic as to persuade their parents to take them to York during the half term just to visit the York Centre. Through a wide range of vicarious experiences facilitated by a wide range of resources, the children became appreciative of many aspects relating to the Vikings and their way of life which the popular stereotype completely overlooks. Similarly, the knowledge and empathy gained from such an in-depth study highlights one of the major weaknesses of the National History curriculum which does not provide the time nor opportunity for such a study at this level.

The computer, even the humble and aged, eight-bit BBC B utilising a variety of software tools, can play a valuable part in presenting the topic to the children and bringing to the learning situation an aspect which is fresh and highly motivating. Ageing though it is, *The Vikings Suite* was a complete success but due to the age of the children a good deal of teacher-support was required. *Developing Tray* also provided the children with a fascinating psycho-linguistic exercise. Other software tools helped children improve or extend their project work. In this topic the classroom computer had a very high profile in the range of activities presented to children.



What does everyone who creates moving pictures want?



A sneak preview.

Render Bender is the graphics package that allows the user to produce remarkable animated graphic sequences using Ray Tracing.

Ray Tracing isn't nearly as complex as it sounds. Basically, in a ray traced sequence, every pixel on the screen takes all relevant light sources into account. Ensuring that all the reflections and refractions are correctly calculated even if the light is reflected off several surfaces. The image could be no more faithful if you were filming real objects in real light. To produce such a superb animated sequence, however, was quite a difficult task – Until now.

Illuminator has changed all that. It is a fully RISC OS graphical front end to Render Bender. Allowing the user to create a series of frames manually, or to give it a start point and an end point, leaving it to generate the frames in between. What you are getting is the ability to take a sneak

preview. You can see what you are going to get, before you get it. After you've created your outline frames in Illuminator, you then transfer the files to Render Bender, the fully RISC OS Ray Tracing part of the package. Which all means that now, to achieve powerful 3D Animation, you no longer have to be a mathematical genius. You just have to be the proud owner of Render Bender 2.

For more information please write to the address below for a Render Bender fact pack. We're sure you'll find it quite illuminating.

Price – £135.00 inc. Vat.

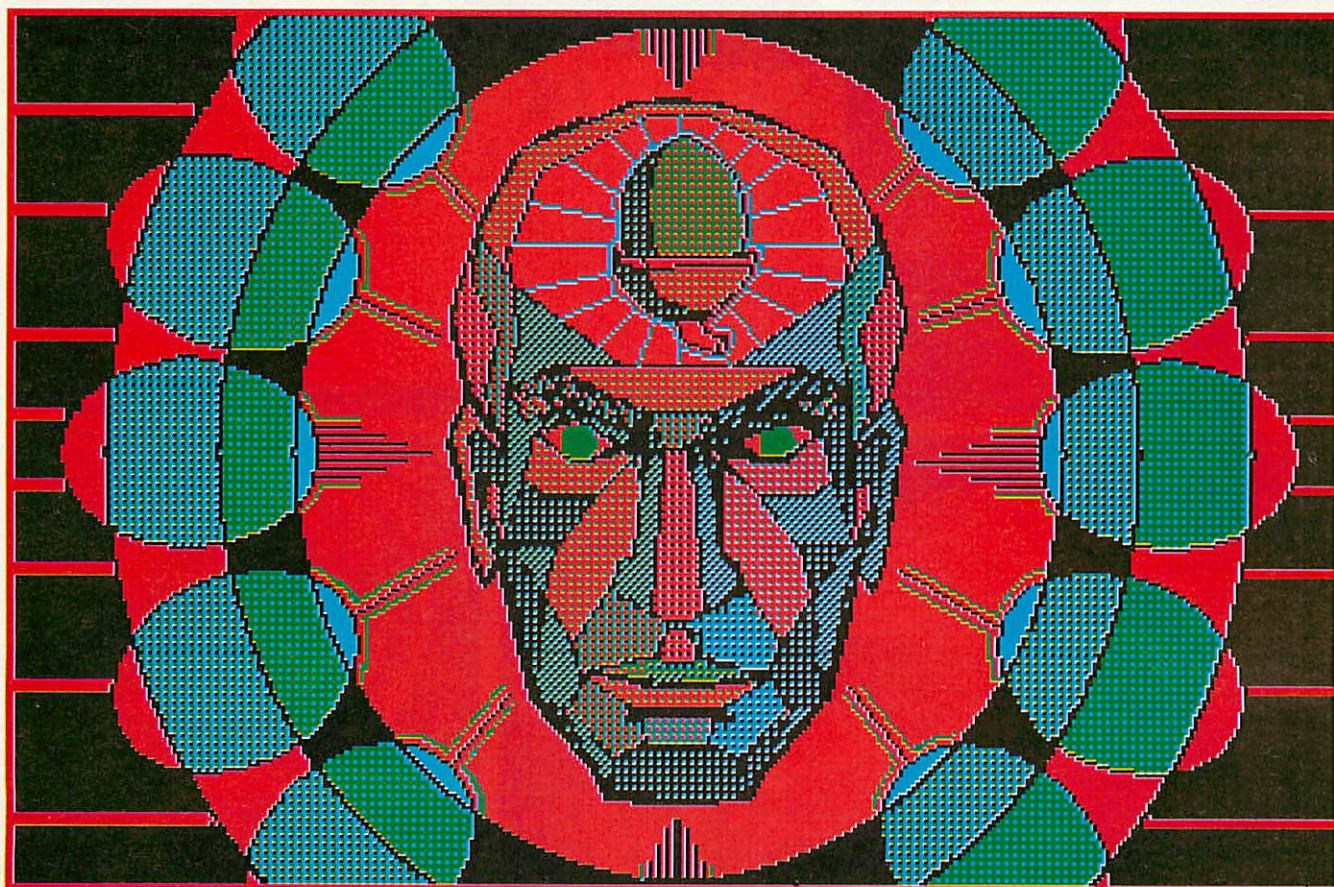
To upgrade from the original Render Bender to Render Bender 2 send us your original disc plus £74.95.



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CUNNING CRUNCHING



Computer graphics is an area in which most people dabble at one time or another. This month I have devoted *Pieces of Eight* to a couple of interesting graphical routines that will allow you to squish, squash and stretch your screens until they feel positively sick!

Of the most popular routines *BAU* ever published, the screen compression programs *LDPIC* and *SVPIC* certainly feature near the top of the list. They were originally developed to squeeze lots of pictures onto the *Acorn User* gallery disc, a few of which are splattered about these pages. The disc had on it 25 screens (coming to 500k) and a few more utilities. All this, unsquashed, added up to 600K worth of data. Since the *BAU* 5.25in discs can only store 200K of data then you can immediately see the benefits of such compression routines!

When people saw this routine in action the source code was called for, and it was published in the October 1986 issue. The programs to

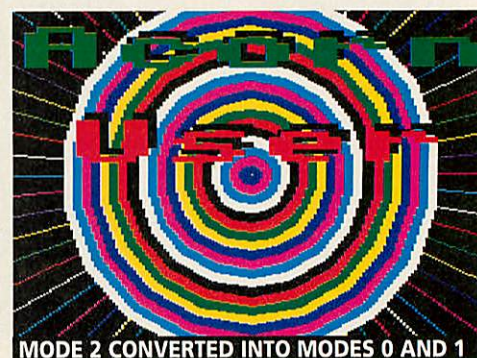
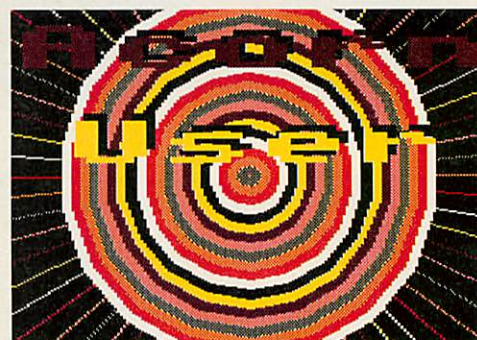
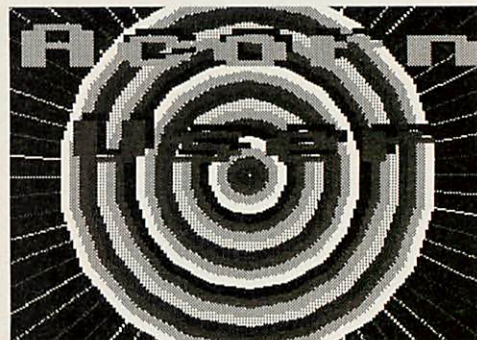
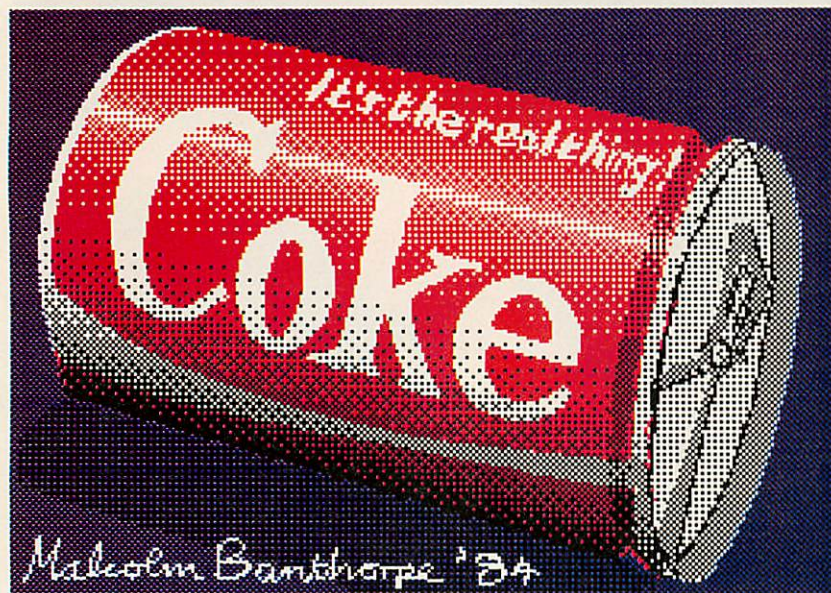
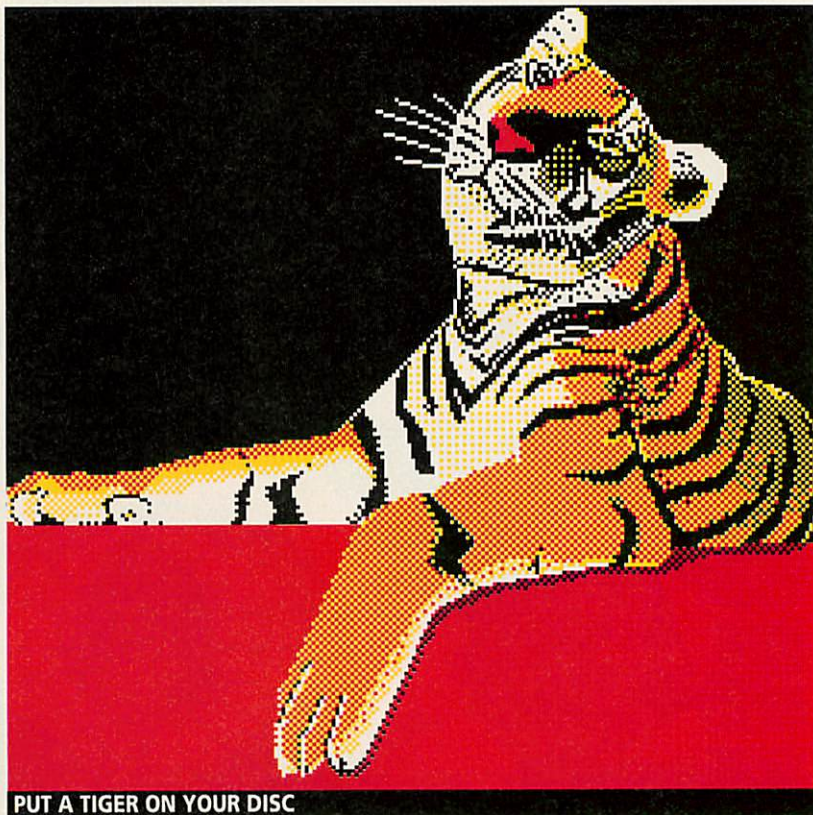
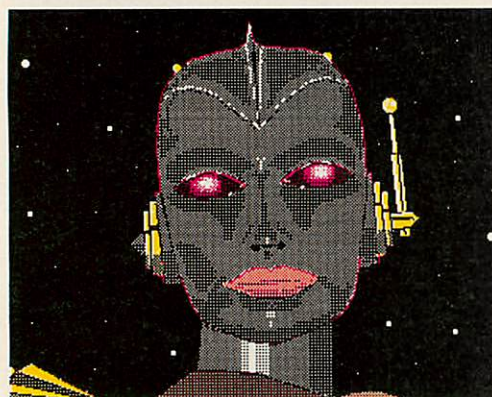
PAUL JAMES continues with his collection of Beeb-stretching routines and shows you how to do the Crunch!

generate the *LDPIC* and *SVPIC* code (pronounced 'ludpic' and 'suvpic' believe it or not) are the first two *Pieces of Eight* listings on the yellow pages this month.

Screen memory on the Beeb is just the same as normal memory – you can even run Basic programs in it – as long as nothing is printed over the top of them, or the screen isn't cleared. The difference is that the video register reads the memory addresses and turns the numbers into a signal suitable to drive a monitor.

To save a screen in mode 5 you would type `*SAVE Screen 5800 8000`. The parameters 5800 and 8000 are hexadecimal addresses. `&5800` is the start and `&8000` the end of the screen memory, which is where the video chip finds its data. The ampersands denote that the number is in hexadecimal. Different modes use up different amounts of memory.

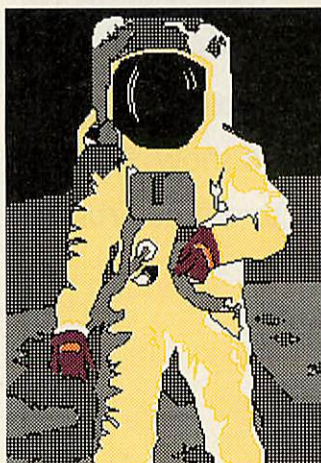
For instance the higher resolution Mode 1 takes up the area in memory from `&3000` to



&8000. This is 20K of Ram. Type in listing 1 and save it as SVPIC-S. When you run it (go ahead, try it now) the program will create a machine code file called SVPIC, if you have typed it right. If it isn't, then you will be told.

The second listing when entered and run (first save it as LDPIC-S though) will save a file called LDPIC. If you have ADFS then put these two files in your library. DFS users should leave them on a utility disc or graphics disc. Then typing *SVPIC Picname will save a compressed screen (it may take a while) and *LDPIC Picname will decompress it. As a comparison, I 'Svpiced' a screen from 20,480 bytes down to just 6,310 bytes, about 30 percent of its original size.

Run length encoding is used to compress the screens. This detects sequences of bytes of the



same value and replaces them with two bytes, the first one being the value, the second one the number of times it occurs.

This routine is very good at compressing screens with large areas of the same colour, but for a screen that has lots of dithering effects this routine is not as efficient as it could be. SVPIC gets round this using a rather cunning stunt. It actually tries to compress the screen several times, each time increasing the step it takes to get the next byte. It then uses the step which was most efficient. For example if a lot of the screen is dithered, every other byte being the same, then a step of two will increase the efficiency of the routine greatly. This is the reason why some SVPICed screens may load differently.

Finally here is a short routine that will load a named screen, and then compress it, without overwriting it with text or the cursor.

```
10 MODE 7
20 *CAT
30 INPUT "Name of screen to
compress : "s$
40 INPUT "Mode screen is in :
"mode%
50 MODE mode%
60 VDU 23;8202;0;0;0;
70 OSCLI "Load "+s$
80 *SVPIC Crunched
90 MODE 7
100 PRINT "Saved as 'Crunched'"
110 END
```

Type this in and save it as Compress. Running it will ask you for the screen to load and which screen mode it is in. If the screen has any palette changes (meaning VDU 19) then put these in after the line to turn the cursor off (line 60). SVPIC will save these, and when the screen is LDPIed the routine will read the colour translations and ensure that the screen is displayed correctly.

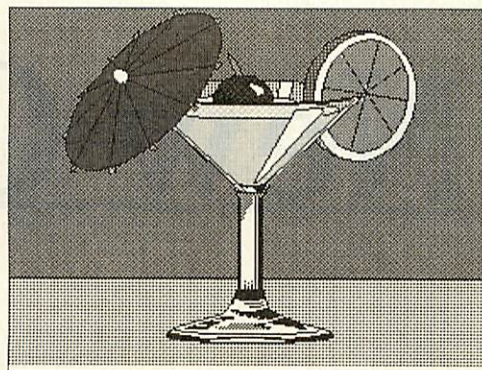
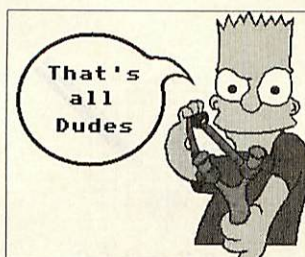
Mode to mode

The second utility this month is a routine that will convert screensaves from one mode to another. Phil Wilks found that many art packages used modes 0, 1 or 2, but were unable to load a mode 2 screensave into a mode 0 screen. Trying this will just give you a mess, because each mode uses a different layout.

Phil's program overcomes this and allows you to convert a mode 1 or 2 screen to mode 0 or a mode 2 screen into mode 1, at the gain of extra resolution, but with less colours.

A typical use for this routine would be to transport a screen created in one art package to another one that uses a different mode. Phil suggests you could also use it to see how your colourful mode 2 screen will come out on your black and white printer, by converting it to mode 0, which has two colours. This can be done quickly, in less than a second actually, and you save paper at the same time.

There is one listing to type in. Listing 3 will create the necessary tables for the conversions and the actual machine code routines which are then saved as O.Modecon. When running this set page to &1900. Much of the code replicates itself, so you could save yourself a lot of time by deft use of the copy keys.



New colours for old

In modes 0, 1 and 2 screen memory runs from &3000 to &8000, and screens can be loaded into each of the modes. The difference is in how each byte is decoded to represent a colour on the monitor. In mode 2 the byte is able to represent two pixels, each of which has 16 different possible states, therefore 16 colours can be used. In mode 0, on the other hand, each bit represents one pixel, representing one of two states, either black or white, on your monitor.

Any one byte can hold a maximum of 256 different values (0 to 255). Phil simply worked out a table in which each value corresponds to a value in mode 0, 1 or 2 which will look correct on screen.

In the listing the tables are created, then the machine code routines which use them are assembled. The routine uses black-and-white dot patterns to approximate to screen colours. Converting a mode 1 or 2 screen into mode 0 means loading it into mode 0, then calling the appropriate machine code routine.

As an example, here is a listing to take a named mode 2 screen and translate it into a mode 0 screen.

```
10 *Load Convert
20 mode1to0%=&1500
30 mode2to0%=&1524
40 mode2to1%=&154C
50 MODE 0
60 VDU 23;8202;0;0;0;
70 *LOAD Screen
80 CALL mode2to0%
90 *Save Newscr 3000 8000
100 END
```

The three code entry points are mode1to0%, mode2to0% and mode2to1% respectively. For instance, to convert a mode 2 screen to mode 1 then change line 40 to MODE 1 and line 70 to CALL mode2to1%.

Competition

If you think you can do better than the screens featured here, and we're sure you'll agree that's quite a challenge, then send in your eight-bit masterpieces on disc.

Superior Software will let the five that we judge the best choose a game from its extensive range. So get drawing.

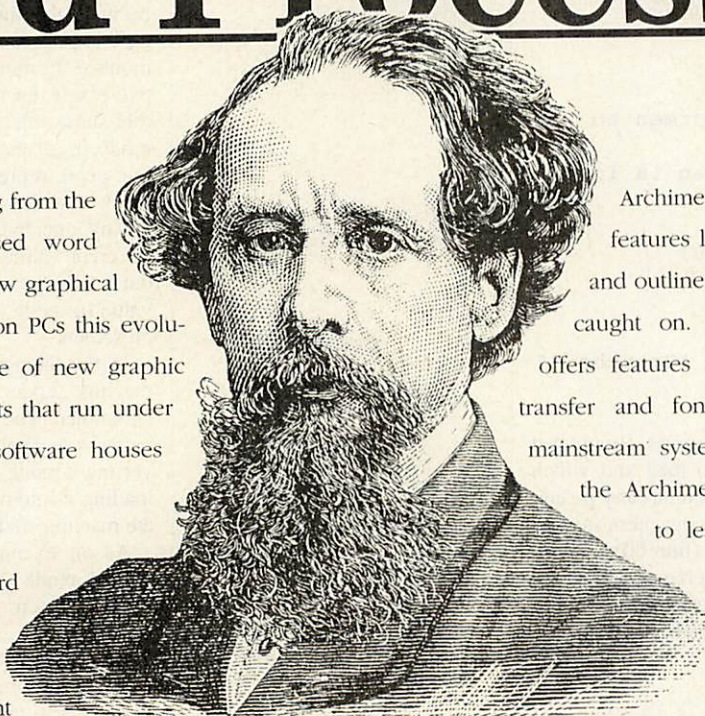
Send in your screens on a disc (any format) with your name and address written on the label. The closing date for entries is the end of September 1991.

The New Generation of Word Processors

Word processing is evolving from the traditional character based word processors of the past to the new graphical based word processors. Even on PCs this evolution is evident with the release of new graphic based word processing products that run under Windows 3 from the largest software houses Microsoft, Wordstar and Lotus.

The new generation of word processors all have certain features in common. They all allow free use of different text sizes and styles. They all offer a range of graphic manipulating tools and, of course, they all operate under a windowing environment.

While most PC users are only just coming to grips with the new style of word processing, Archimedes owners have been able to word process like this for 18 months, since the introduction of Impression.



This image (an old engraving of Charles Dickens) was captured using Scan-Light Junior at 400 dpi. This scanner is ideal for black and white line-art or pictures such as this.

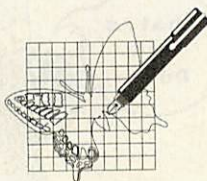
Archimedes owners had the use of features like a good WIMP environment and outline fonts long before the PC world caught on. And today the machine still offers features such as inter-application data transfer and font anti-aliasing that no other mainstream system can provide, ensuring that the Archimedes architecture will continue to lead the way. Quite simply you get tomorrow's PC architecture today on the Archimedes.

With the release of the new greyscale scanner, Computer Concepts can now supply all the components for Archimedes owners to put together the ultimate word processing system.

Our hardware and software products support all three stages of document production, from capturing pictures, through word processing and document creation to printing.



capture



create



print



capture

While the Archimedes is powerful enough and flexible enough to handle graphics with supreme ease, this is only useful if it is equally easy to input graphics. The Scan-Light family of image scanners offers a range of capabilities and prices to suit any requirement.

There are three members of the Scan-Light family of image scanners. They are supplied with interface board and simple to use software. (Versions are available to fit internally in the A3000). And thanks to direct data exchange, once a picture has been scanned, it can be dropped directly into an Impression document (or other applications) without having to bother with filenames or having to save, then re-load as would be necessary in other systems.



Scan-Light A4 will scan complete A4 pages, up to 400 dpi. It is shown here fitted to its optional sheet feeder. If installed with a LaserDirect printer, the software offers a quick scan-and-print photocopy facility.

Scan-Light A4 £399 +VAT (£468.82 inc)

With sheet feeder £499 +VAT (£586.32 inc)



This image was captured from a print using the new greyscale Scan-Light Junior 256. This is able to capture, display and reproduce stunning quality half-tone photographs, although it can also scan black and white images at up to 400 dpi.



Scan-Light Junior mono..

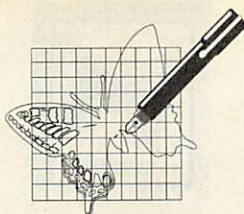
£189+VAT (£220.07 inc)

Scan-Light Junior 256...

£220+VAT (£258.50 inc)

Scan-Light Junior and Junior 256 are hand-held devices capable of capturing images up to 105mm wide (4.1inches).

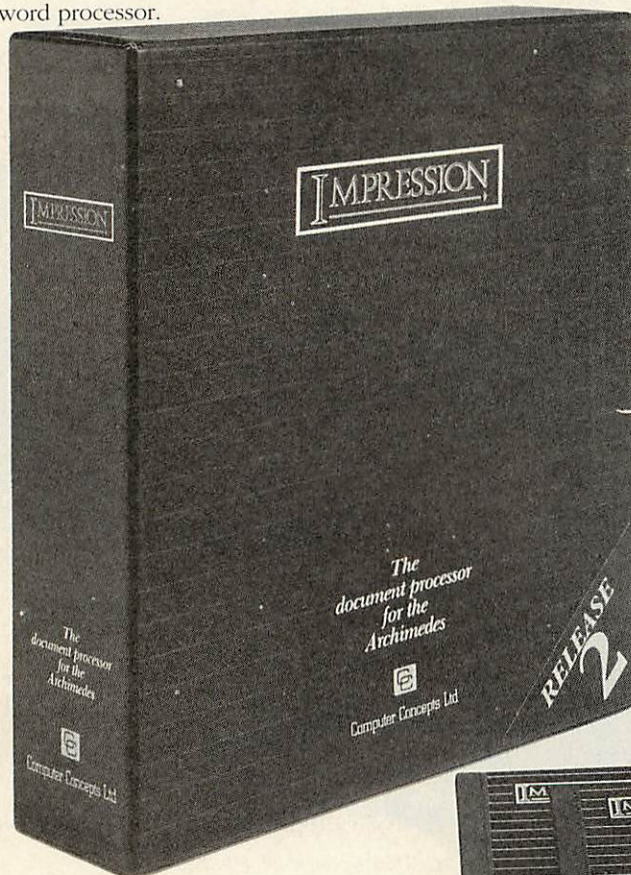
IMPRESSION



create

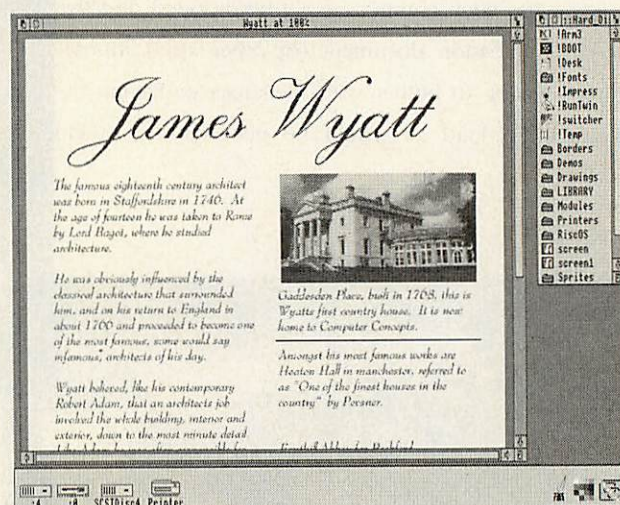
IMPRESSION Junior

The key part of any system is the word processor. With over 10,000 users (not including the hundreds of educational site-licences installed) Impression Junior and Impression II have become an industry standard for the Archimedes, and it is still growing in popularity. It is probably no co-incidence that the new word processors for other machines are adopting many Impression-like features since it is only logical that, as machines become more powerful, they begin to integrate desk-top-publishing facilities with traditional word processing. Impression is simply the most efficient, compact, fastest product in its class, able to handle the simplest word processing jobs as well as the most complex desk-top-publishing work. It is the only word processor designed to print using either the native character mode of the printer (ideal for text only word processing and dot matrix printers) or using the RISC OS printer drivers for top quality, full page graphics and text. Imagine the freedom of near typeset quality type - any face, any size, any position on the page, with the ability to place diagrams or pictures wherever desired. Impression offers that freedom - perhaps the ultimate evolution of the word processor.



Impression Junior offers all the key Impression features. Built-in SpellMaster spelling checker, full word processing and DTP abilities, outline fancy font and character font editing, full RISC OS compatibility drives RISC OS printer drivers. It is a small compact program ideally suited for the smaller machine.

Impression Junior £89.95+VAT (£105.69 inc)



What you see on screen is always an exact representation of the final printed page, including fonts, columns and graphics.

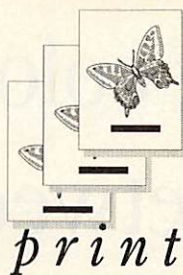
$$J_n(x) = \frac{x^n}{2^n n!} \sum_{s=0}^{\infty} \frac{1}{s!(n+1)^s} \left(-\frac{1}{4}x^2\right)^s$$

If your word processing requirements include any equations or formulae then our Equasor product integrates with Impression to allow equations to be built up graphically, then just dropped into the Impression document where required.

Impression II is able to handle longer or more complex documents. Enhanced DTP abilities such as instant graphic rotation to any angle, Drawfile frame borders, and guide frames. It also offers unique features for long word processed documents such as contents and index generation, unlimited document length (not RAM limited), styles, in-line graphics etc.

Impression II £169+VAT (£198.57 inc)





Once the pictures and text have been processed and arranged as required, you need to be able to print them to the highest possible quality in the shortest possible time. Laser printers provide the quality but have traditionally been slow and expensive. The LaserDirect range of printers offers not only the highest quality printing available (to 600 dpi) but also offers by far the fastest printing available on the Archimedes and at a lower cost than traditional lasers.

lower cost and can also offer 600 dpi printing for a third of the cost of such printers for other machines. Indeed, so significant have been the benefits, direct drive lasers have now all but eliminated traditional laser printers from the Archimedes market, with the LaserDirect range being the most popular laser printers with Archimedes owners.

Integrated solutions

By using the Computer Concepts software and hardware products with the advanced technology of the Archimedes it is possible to create what must surely be the ultimate word and document processing system. A system that allows high quality half-tone pictures to be captured and incorporated into documents, that integrates word processing and desktop-publishing and, finally, outputs top quality laser printed pages.

All Computer Concepts products are available direct from Computer Concepts or from all reputable dealers. More detailed brochures are available for most of our products.



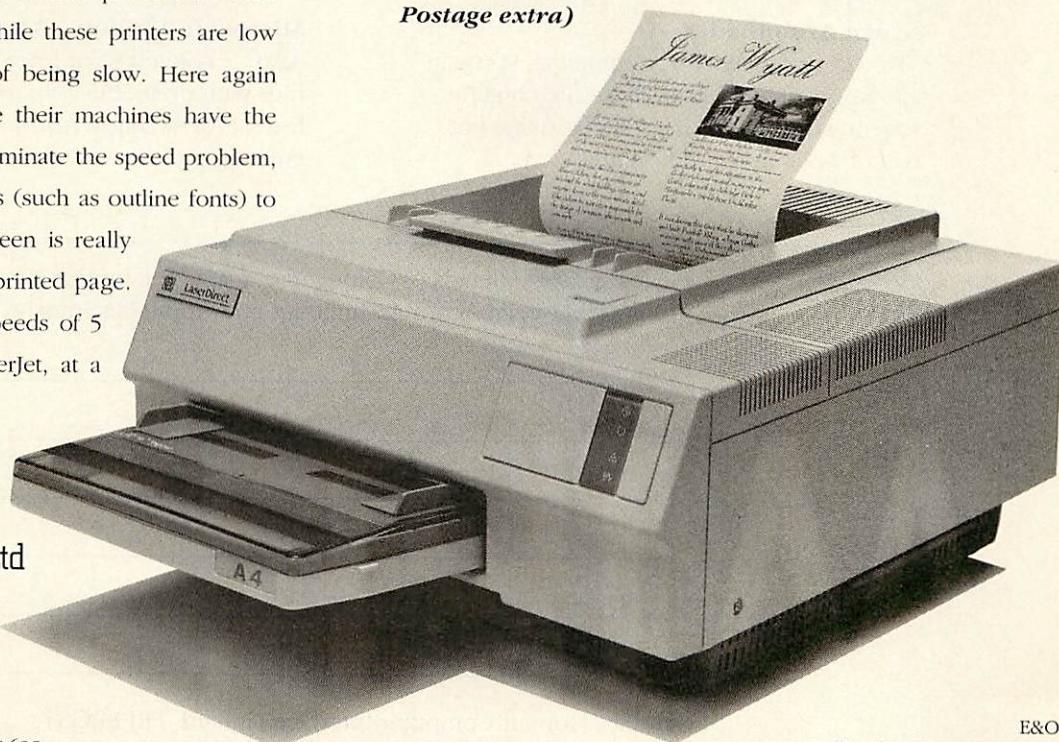
LaserDirect Qume. 6 pages per minute 300 dpi. (2Mbyte machine required.)

LaserDirect Qume £999+VAT (£1173.82 inc. Postage extra)

Direct drive laser printers are not a new idea. Apple Mac users have been able to buy direct drive printers for their computers for some time, but while these printers are low cost, they have the reputation of being slow. Here again Archimedes owners win because their machines have the necessary processing power to eliminate the speed problem, and the operating system facilities (such as outline fonts) to ensure that what you see on screen is really exactly what you will get on the printed page. LaserDirect printers offer print speeds of 5 to 10 times that of a typical LaserJet, at a

LaserDirect HiRes. 8 pages per minute and 300 or 600 dpi. (4Mbytes recommended for 600 dpi.)

LaserDirect HiRes8 £1495+VAT (£1756.62 inc. Postage extra)



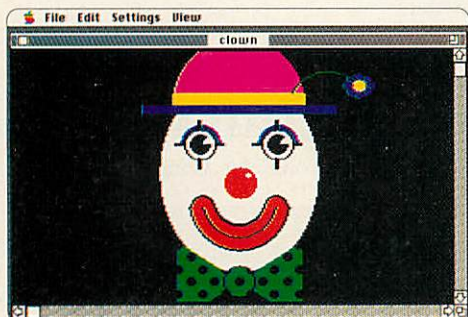
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Hemel Hempstead
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Tel 0442 63933 Fax 0442 231632

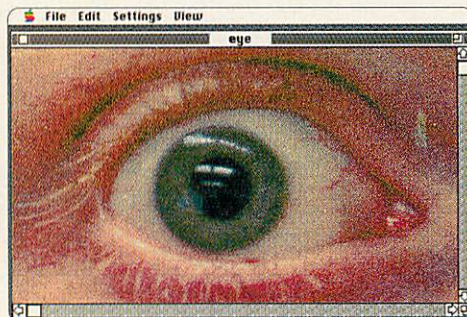
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Announcing colour graphics conversion between the Acorn Archimedes and the Apple Macintosh



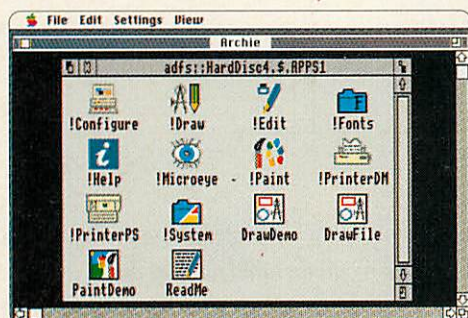
BBC Micro, Master 128, or Master Compact

Convert to or from a BBC Screen Dump in any appropriate mode, including Teletext. You can dynamically adjust the colours assigned to each logical colour in the original dump, to take account of different palette settings.



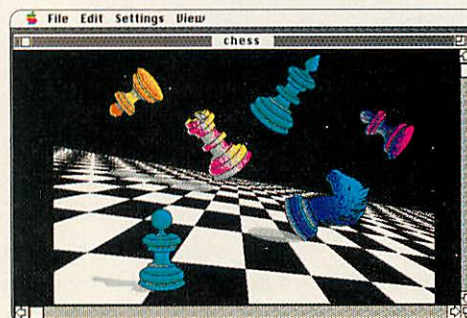
Macintosh

Convert to or from PICT, Colour PICT, or MacPaint format. Images can be manipulated in drawing and painting programs, or placed in other Macintosh applications, such as PageMaker, for subsequent colour printing.



Acorn Archimedes

Convert to or from an Archimedes Sprite in any appropriate mode. If the file contains several sprites you can select the one you want from a list of their names.



Microsoft Windows 3.0 on the IBM PC

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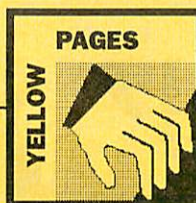
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Program	Page	BBC B B+	B+/ 128	Master 128	Master Compact	Electron	6502SP/ Turbo	ADFS	Econet	Shadow Ram	Archimedes/ A3000	Monthly disc
★Info	49											
Info 1a		■	■	■	■	■	■		■	■	■	■
Info 1b		■	■	■	■	■	■		■	■	■	■
Info 2a								■	■		■	■
Info 2b		■	■	■	■	■	■	■	■	■		■
Info 3a									■		■	■
Info 3b		■	■	■	■	■	■	■	■	■		■
Info 4a									■		■	■
Info 5a									■		■	■
Info 6a									■		■	■
Info 7a									■		■	■
Info 8a		■	■	■	■	■	■	■	■	■	■	■
Info 8b		■	■	■	■	■	■	■	■	■	■	■
Info 8c									■		■	■
Juggling	56											
Juggle1									■		■	■
Juggle2									■		■	■
Juggle3		■	■	■	■	■	■	■	■	■		■
Juggle4		■	■	■	■	■	■	■	■	■		■
Wide VDU	63											
Wide1		■							■			■
Shopping	64											
Shopping1		■	■	■	■		■	■	■	■	■	■
Pieces of Eight	73											
Po81		■	■	■	■	■	■	■	■	■		■
Po82		■	■	■	■	■	■	■	■	■		■
Po83		■	■	■	■	■	■	■	■	■		■

★Info

Listing 1

```

10 REM MakeAts (Infola)
20 REM by Garry Quested
30 REM for B/B+/M/C/E
40 REM (c) BAU Sep 91
50 :
60 MODE 1
70 HIMEM=&2900
80 code%=&2900
90 maxx%=9
100 maxy%=6
110 read=&70
120 x=&74
130 y=&75
140 n=&76
150 p=&77
160 temp=&78
170 temp2=&79
180 plot=&80
190 player=&84
200 FOR pass%=0 TO 2 STEP 2
210 P%=code%
220 [OPT pass%
230 JMP react
240 JMP showatom
250 JMP think
260 EQU0 c%-code%
270 EQU0 n%-code%
280 .showatom
290 AND #3
300 PHA
310 LDA #adat% MOD 256
320 STA read
330 PLA
340 CLC
350 ADC #adat% DIV 256
360 STA read+1
370 LDX #4
380 .rowloop
390 LDY #63
400 .colloop
410 LDA (read),Y
420 AND player
430 STA (plot),Y
440 DEY
450 LDA (read),Y
460 AND player+1
470 STA (plot),Y
480 DEY
490 BPL colloop
500 LDA read
510 CLC
520 ADC #64
530 STA read
540 BCC nh
550 INC read+1
560 .nh
570 LDA plot
580 CLC
590 ADC #640 MOD 256
600 STA plot
610 LDA plot+1
620 ADC #640 DIV 256
630 STA plot+1
640 DEX
650 BNE rowloop
660 RTS
670 :
680 .add
690 LDA x
700 BMI nulladd
710 CMP #maxx%+1
720 BCS nulladd
730 LDA y
740 BMI nulladd
750 CMP #maxy%+1
760 BCS nulladd
770 JSR calcn
780 LDA c%,X
790 BEQ nulladd
800 CMP p
810 BEQ nulladd
820 JSR re
830 STA temp
840 LDX n
850 LDA n%,X
860 CLC
870 ADC #4
880 SEC
890 SBC temp
900 TAX
910 LDA fives%,X
920 RTS
930 .nulladd
940 LDA #0
950 RTS
960 :
970 .calcn
980 LDA y
990 ASL A
1000 ASL A
1010 ADC y
1020 ASL A
1030 ADC x
1040 STA n
1050 TAX
1060 RTS
1070 :
1080 .fives%
1090 EQU0 1
1100 EQU0 5
1110 EQU0 25
1120 EQU0 125
1130 :
1140 .react
1150 STX x
1160 STY y
1170 .re
1180 LDX #4
1190 LDA x
1200 BEQ re2
1210 CMP #maxx%
1220 BNE re3
1230 .re2
1240 DEX
1250 .re3
1260 LDA y
1270 BEQ re4
1280 CMP #maxy%
1290 BNE re5
1300 .re4
1310 DEX
1320 .re5
1330 TXA
1340 RTS
1350 :
1360 .com2
1370 JSR re
1380 PHA
1390 INC x
1400 JSR add
1410 STA temp2
1420 LDA #0
1430 STA temp2+1
1440 DEC x
1450 INC y
1460 JSR add
1470 JSR addon
1480 DEC y
1490 DEC x
1500 JSR add
1510 JSR addon
1520 INC x
1530 DEC y
1540 JSR add
1550 JSR addon
1560 INC y
1570 JSR calcn
1580 PLA
1590 STA temp
1600 SEC
1610 SBC #1
1620 CMP n%,X
1630 BEQ com2c
1640 LDA temp2+1
1650 BNE com2a
1660 LDA temp2
1670 CMP #125
1680 BCS com2a
1690 LDA #125
1700 CLC
1710 ADC temp2
1720 STA temp2
1730 LDA #0
1740 ADC temp2+1
1750 STA temp2+1
1760 JMP com2b
1770 .com2a
1780 LDA #125
1790 SEC
1800 SBC temp2
1810 STA temp2
1820 LDA #0
1830 SBC temp2+1
1840 STA temp2+1
1850 .com2b
1860 LDA temp
1870 SEC
1880 SBC n%,X
1890 ASL A
1900 STA temp
1910 ASL A
1920 ASL A
1930 CLC
1940 ADC temp
1950 STA temp
1960 LDA temp2
1970 SEC

```




```
1980 SBC temp
1990 STA temp2
2000 LDA temp2+1
2010 SBC #0
2020 STA temp2+1
2030 RTS
2040 .com2c
2050 ASL temp2
2060 ROL temp2+1
2070 ASL temp2
2080 ROL temp2+1
2090 .com2d
2100 RTS
2110 :
2120 .addn
2130 CLC
2140 ADC temp2
2150 STA temp2
2160 BCC addn2
2170 INC temp2+1
2180 .addn2
2190 RTS
2200 :
2210 .bm
2220 EQUW 0
2230 .bi
2240 EQUW 0
2250 .bj
2260 EQUW 0
2270 :
2280 .think
2290 STA p
2300 LDA #0
2310 STA bm
2320 STA bm+1
2330 STA x
2340 .thinkloop1
2350 LDA #0
2360 STA y
2370 .thinkloop2
2380 JSR calcn
2390 LDA c%#X
2400 BEQ valid
2410 CMP p
2420 BNE next
2430 .valid
2440 JSR com2
2450 LDA temp2+1
2460 CLC
2470 ADC #40
2480 STA temp2+1
2490 LDA temp2+1
2500 CMP bm+1
2510 BCC next
2520 BNE better
2530 LDA bm
2540 CMP temp2
2550 BCS next
2560 .better
2570 LDA temp2
2580 STA bm
2590 LDA temp2+1
2600 STA bm+1
2610 LDA x
2620 STA bi
2630 LDA y
2640 STA bj
2650 .next
2660 INC y
2670 LDA y
2680 CMP #maxy+1
2690 BNE thinkloop2
2700 INC x
2710 LDA x
2720 CMP #maxx+1
2730 BNE thinkloop1
2740 LDA bi
2750 LDY bj
2760 RTS
2770 :
2780 adat=P%
2790 P%=P%+400
2800 c%=P%
2810 P%=P%+70
2820 n%=P%
2830 P%=P%+70
2840 NEXT passe%
2850 size=120
2860 VDU 23,128,24,126,255,255,255,255,
126,24
2870 i=adat%
2880 FOR atoms=0 TO 3
2890 GCOL 0,3
2900 MOVE 0,1023-size%
2910 MOVE size%,1023-size%
2920 PLOT 85,0,1023
2930 PLOT 85,size%,1023
2940 GCOL 0,0
2950 MOVE 0,1023-size%
2960 DRAW size%,1023-size%
2970 DRAW size%,1023
2980 DRAW 0,1023
2990 DRAW 0,1023-size%
3000 IF atoms=1 PROCircle(1/2,1/2)
3010 IF atoms=2 PROCircle(1/3,2/3):PR
Occircle(2/3,1/3)
3020 IF atoms=3 PROCircle(1/2,1/4):PR
Occircle(1/4,3/4):PROCircle(3/4,3/4)
3030 FOR row=0 TO 3
3040 FOR byte=0 TO 63
3050 ?i%=(43000+640*row+byte%)
3060 i=i%+1
3070 NEXT
3080 NEXT
```

```
3090 NEXT
3100 PRINT"Bytes used: "P%-code%
3110 OSCLI"SAVE AtCode "+STR$code%+" "
+STR$P%
3120 END
3130 :
3140 DEF PROCcircle(dx,dy)
3150 x=size%*dx
3160 y=1023-size%*dy
3170 MOVE x-16,y+16
3180 VDU 5,128,4
3190 ENDPROC
```

Listing 2

```
10 REM Atoms8 (Info1b)
20 REM by Garry Quedest
30 REM for B/B+/M/E/C
40 REM (c) BAU September 1991
50 :
60 MODE 1
70 HIMEM=62900
80 PROCinit
90 PROCwind
100 playing%=2
110 con%(1)=1
120 con%(2)=0
130 PROCnewgame
140 REPEAT
150 PROCnewgame
160 PROCmenu
170 stillplaying%=playing%
180 REPEAT
190 gameover%=FALSE
200 FOR p%=1 TO playing%
210 PROCshowplayers(p%)
220 IF count%(p%)>0 PROCplay(p%):IF s
tillplaying%=1 winner%=p%:gameover%=TRUE
230 NEXT
240 UNTIL gameover%
250 PROCshowplayers(winner%)
260 PROCm("Player "+STR$winner%+" has
won!",0)
270 PROCm("Press a key...",2)
280 wait=GET
290 UNTIL FALSE
300 END
310 :
320 DEF PROCmenu
330 p%=0
340 PROCshowcols
350 REPEAT
360 PROCshowplayers(p%+1)
370 PROCm("Atoms",0)
380 PROCm("Press S to start",2)
390 REPEAT
400 key%=INSTR(" 2""3#4$5%6&89"+CHR$13
6+" "+CHR$137+" "+CHR$13,INKEY$(10))/2
410 UNTIL key%=0
420 IF key%>=1 AND key%<=5 playing%=ke
y%+1
430 IF key%=7 p%=(p%+playing%-1) MOD p
laying%
440 IF key%=8 p%=(p%+1) MOD playing%
450 IF key%=9 con%(p%+1)=1-con%(p%+1)
460 IF p%>playing%-1 p%=playing%-1
470 IF key%<7 OR key%=9 CLS:PROCshowco
ls
480 UNTIL key%=6
490 ENDPROC
500 :
510 DEF PROCplay(p%)
520 IF con%(p%)=0 PROCcomputer(p%) ELS
E PROChuman(p%)
530 ENDPROC
540 :
550 DEF PROCcomputer(p%)
560 SOUND 1,-10,129,3
570 SOUND 1,-10,117,3
580 PROCm("Your move",0)
590 PROCindic
600 gotmove%=FALSE
610 REPEAT
620 key%=GET
630 IF key%=136 PROCmove(-1,0)
640 IF key%=137 PROCmove(1,0)
650 IF key%=138 PROCmove(0,-1)
660 IF key%=139 PROCmove(0,1)
670 IF key%=13 AND (FNN(ix%,iy%)=0 OR
c%?(ix%+10*iy%)=p%) THEN gotmove%=TRUE
680 UNTIL gotmove%
690 PROCindic
700 PROCreact(ix%,iy%)
710 ENDPROC
720 :
730 DEF PROCmove(dx,dy%)
740 PROCindic
750 ix%=(ix%+10*dx%) MOD 10
760 iy%=(iy%+7*dy%) MOD 7
770 PROCindic
780 ENDPROC
790 :
800 DEF PROCindic
810 GCOL 4,3
820 MOVE ix%*128,4+iy%*128
830 PLOT 1,120,0
840 PLOT 1,0,120
850 PLOT 1,-120,0
860 PLOT 1,0,-120
870 ENDPROC
880 :
890 DEF PROCcomputer(A%)
900 PROCm("Thinking...",0)
```

```
910 A%=USR(code%+6)
920 PROCreact(A% AND &FF,(A% AND &FF00
) DIV 4100)
930 ENDPROC
940 :
950 DEF PROCreact(x%,y%)
960 IF stillplaying%<2 ENDPROC
970 oldp=c%?(x%+10*y%)
980 count%(oldp)=count%(oldp)-FNN(x%
,y%)
990 n%?(x%+10*y%)=FNN(x%,y%)+1
1000 count%(p%)=count%(p%)+FNN(x%,y%)
1010 c%?(x%+10*y%)=p%
1020 PROCshowat(x%,y%)
1030 IF oldp>0 AND count%(oldp)=0 THE
N count%(oldp)=-1:stillplaying%=stillp
aying%-1:PROCshowcols
1040 reactor%=FNN(x%,y%)
1050 IF FNN(x%,y%)>reactor% PROCexplod
e(x%,y%,reactor%)
1060 ENDPROC
1070 :
1080 DEF PROCexplode(x%,y%,reactor%)
1090 n%?(x%+10*y%)=FNN(x%,y%)-reactor%
1100 count%(p%)=count%(p%)-reactor%
1110 PROCshowat(x%,y%)
1120 IF x%=0 PROCreact(x%-1,y%)
1130 IF x%=maxx% PROCreact(x%+1,y%)
1140 IF y%=0 PROCreact(x%,y%-1)
1150 IF y%=maxy% PROCreact(x%,y%+1)
1160 PROCshowat(x%,y%)
1170 ENDPROC
1180 :
1190 DEF PROCnewgame
1200 FOR p%=1 TO maxplayers%
1210 count%(p%)=0
1220 NEXT
1230 FOR i%=0 TO maxx%
1240 FOR j%=0 TO maxy%
1250 n%?(i%+10*j%)=0
1260 c%?(i%+10*j%)=0
1270 PROCshowat(i%,j%)
1280 NEXT
1290 NEXT
1300 IF col%=0 THEN !player=6AA55 ELSE
!player=1(43000+48*(col%-1))
1310 CALL code%+3
1400 ENDPROC
1410 :
1420 DEF PROCinit
1430 VDU 19,2,4,0,0,0
1440 VDU 23,224,170,85,170,85,170,85,17
0,85
1450 VDU 23,225,24,60,126,255,24,24,24,
24
1460 CLS=#2900
1470 OSCLI"LOAD AtCode "+STR$code%
1480 c%=code%+code%19
1490 n%=code%+code%113
1500 maxx%=9
1510 maxy%=6
1520 plot=480
1530 player=484
1540 maxplayers%=6
1550 playing%=6
1560 DIM con%(maxplayers%),count%(maxpl
ayers%)
1570 *FX 4,1
1580 ENDPROC
1590 :
1600 DEF PROCm(m$,y%)
1610 PRINTTAB(20,y%)SPC20;TAB(30-LEN(m$
)/2,y%)m$
1620 ENDPROC
1630 :
1640 DEF PROCshowcols
1650 RESTORE
1660 FOR i%=0 TO playing%-1
1670 READ c1%,c2%
1680 FOR j%=0 TO 1
1690 PRINT TAB(i%*3,j%);
1700 COLOUR c1%
1710 COLOUR 128+c2%
1720 IF c1%=c2% VDU 32,32 ELSE VDU 224,
224
1730 VDU 9
1740 NEXT
1750 VDU 5
1760 GCOL 0,0
1770 PROCch(0,4)
1780 PROCch(0,-4)
1790 PROCch(4,0)
1800 PROCch(-4,0)
1810 GCOL 0,3
1820 PROCch(0,0)
1830 VDU 4
1840 PROCwind
1850 NEXT
1860 COLOUR 128
1870 COLOUR 7
1880 ENDPROC
1890 :
1900 DEF PROCch(dx,dy%)
1910 IF count%(i%+1)<0 ENDPROC
1920 MOVE 96*i%+16+dx%,1003+dy%
```

```
1930 IF con%(i%+1)=0 VDU 67 ELSE VDU 72
1940 ENDPROC
1950 :
1960 DEF PROCshowplayers(p%)
1970 VDU 5
1980 FOR i%=1 TO playing%
1990 IF i%=p% GCOL 0,3 ELSE GCOL 0,0
2000 MOVE 96*i%-80,951
2010 VDU 225
2020 NEXT
2030 VDU 4
2040 PROCwind
2050 ENDPROC
2060 :
2070 DEF FNN(i%,j%)=n%?(i%+10*j%)
2080 :
2090 DEF PROCwind
2100 VDU 23;8202;0;0;28,0,3,39,0
2110 ENDPROC
2120 :
2130 DEF FNNre(X%,Y%)=USR(code%) AND &FF
2140 :
2150 DATA 1,0,3,3,1,2,1,1,2,3,2,2
```

Listing 3

```
10 REM >Coral32 (Info2a)
20 REM By Jan Vlietinck
30 REM For Archimedes only
40 REM (c) BAU September 1991
50 :
60 ON ERROR PROCError
70 MODE 13:OFF
80 PROCinit
90 PROCcode
100 PROCcoral
110 END
120 :
130 DEF PROCError
140 IF ERR = 17 AND NOT INKEY-2 RUN
150 MODE 0
160 IF ERR <> 17 PRINTREPORT$;" at lin
e "+ERR
170 END
180 :
190 DEF PROCinit
200 DIM code 1000
210 shift = 3
220 val = 4
230 rnd1 = 5
240 rnd2 = 6
250 count = 7
260 scrn = 8
270 addr = 9
280 x = 10
290 y = 11
300 link = 14
310 pc = 15
320 ENDPROC
330 :
340 DEF PROCcode
350 FOR pass=0 TO 2 STEP 2
360 P%=code
370 [OPT pass
380 .coral ADD shift,R0,#11
390 ADD val,R1,#16
400 MOV rnd1,R2
410 MOV rnd2,R3
420 LDR scrn,scrn%
430 MOV count,#1<<20
440 .loop ADD rnd1,rnd1,rnd1,LSL
#2
450 ADD rnd2,rnd2,rnd2,LSL #2
460 MOV x,rnd1,LSR #24
470 MOV y,rnd2,LSR #24
480 CMP y,#1
490 BLS loop
500 CMP y,#254
510 BHS loop
520 ADD x,x,#32
530 ADD addr,y,y,LSL #2
540 ADD addr,scrn,addr,LSL #6
550 LDRB R0,[addr,x]!
560 CMP R0,#0
570 SUBNES count,count,#1
580 BNE loop
590 LDRB R1,[addr,# 1]
600 LDRB R0,[addr,#-1]
610 ADD R1,R1,R0
620 LDRB R0,[addr,# 320]
630 ADD R1,R1,R0
640 LDRB R0,[addr,#-320]
650 ADD R1,R1,R0
660 LDRB R0,[addr,# 319]
670 ADD R1,R1,R0
680 LDRB R0,[addr,#-319]
690 ADD R1,R1,R0
700 LDRB R0,[addr,# 321]
710 ADD R1,R1,R0
720 LDRB R0,[addr,#-321]
730 ADDS R1,R1,R0
740 ADD R0,val,count,LSR shift
750 STNFB R0,[addr]
760 SUBS count,count,#1
770 BPL loop
780 MOV pc,link
790 :
800 .scrn% EQUW 148
810 EQUW -1
820 [NEXT
830 SYS "OS_ReadVduVariables",scrn%,ac
rn%
840 ENDPROC
```



```

850 :
860 DEF PROCcoral
870 *POINTER
880 MOUSE ON
890 MOUSE RECTANGLE 124,4,1028,1012
900 held=FALSE
910 REPEAT
920 CLS
930 RECTANGLE 120,0,1036,1020
940 REPEAT
950 REPEAT
960 MOUSE x,y,z
970 IF z=0 held=FALSE
980 UNTIL z AND NOT held
990 IF z AND 4 THEN
1000 IF NOT held POINT x,y
1010 ELSE
1020 held=FALSE
1030 ENDIF
1040 IF z AND 1 THEN
1050 WAIT
1060 rx=x+RND(200)-100
1070 ry=y+RND(200)-100
1080 IF rx<124 rx=124
1090 IF rx>1028+124 rx=1028+124
1100 IF ry<4 ry=4
1110 IF ry>1012+4 ry=1012+4
1120 POINT rx,ry
1130 ENDIF
1140 UNTIL z=2
1150 A%=RND(9)
1160 B%=RND(200)
1170 C%=RND
1180 D%=RND
1190 CALL coral
1200 REPEAT
1210 MOUSE x,y,z
1220 held=TRUE
1230 UNTIL z
1240 UNTIL 0
1250 ENDPROC

```

Listing 4

```

10 REM Coral8 (Info2b)
20 REM By Van Vlietinck
30 REM 8 Bit Version by Dave Lawrence
40 REM For all 8 Bit machines
50 REM (c) BAU September 1991
60 :
70 ON ERROR GOTO 150
80 MODE 2
90 VDU 23,8202,0;0;0;0;
100 PROCinit
110 PROCcode
120 PROCcoral
130 END
140 :
150 IF ERR = 17 AND NOT INKEY=2 GOTO 1
20
160 MODE 7
170 IF ERR <> 17 REPORT:PRINT" at line
";ERR
180 END
190 :
200 DEF PROCinit
210 DIM code 800
220 xsize=160
230 ysize=128
240 counter=xsize*ysize*16
250 linelength=20*8*4
260 zp=70
270 count=FNzp(4)
280 rnd1=FNzp(4)
290 rnd2=FNzp(4)
300 tmp=FNzp(4)
310 x=FNzp(1)
320 y=FNzp(1)
330 addr=FNzp(2)
340 addr2=FNzp(2)
350 mask=FNzp(1)
360 nextmask=FNzp(1)
370 col=FNzp(1)
380 row=FNzp(1)
390 colour=FNzp(1)
400 colcount=FNzp(1)
410 coldelay=FNzp(1)
420 coladd=FNzp(1)
430 ENDPROC
440 :
450 DEF PROCcode
460 FOR pass=0 TO 2 STEP 2
470 P%code
480 OPT pass
490 .coral
500 STA colour
510 STX coldelay
520 STX colcount
530 STY coladd
540 .loop
550 OPT FNmul5(rnd1)
560 OPT FNmul5(rnd2)
570 LDA rnd1+3
580 BEQ loop
590 CMP #159
600 BCS loop
610 AND #1
620 STA col
630 TAX
640 LDA masks,X
650 STA mask
660 LDA nextmasks,X
670 STA nextmask

```

```

680 LDA rnd2+3
690 LSR A
700 TAY
710 BNE ynot0
720 .jloop
730 JMP loop
740 .ynot0
750 CMP #127
760 BEQ jloop
770 AND #3
780 STA row
790 LDA #0
800 STA addr+1
810 LDA rnd1+3
820 AND #&FE
830 ASL A
840 ROL addr+1
850 ASL A
860 ROL addr+1
870 CLC
880 ADC scrlo,Y
890 STA addr
900 LDA addr+1
910 ADC scrhi,Y
920 STA addr+1
930 LDY #10
940 LDA (addr),Y
950 AND mask
960 BEQ squareempty
970 JMP alldone
980 .squareempty
990 LDA col
1000 BNE midrow
1010 LDY #2
1020 .midrow
1030 LDA (addr),Y
1040 AND nextmask
1050 BNE midjmp
1060 TYA
1070 CLC
1080 ADC #8
1090 TAY
1100 LDA (addr),Y
1110 AND nextmask
1120 BEQ endmid
1130 .midjmp
1140 JMP doplot
1150 .endmid
1160 LDA row
1170 BEQ cantdotop
1180 LDX #8
1190 LDY #8
1200 LDA col
1210 BNE toprow
1220 LDY #0
1230 .toprow
1240 LDA (addr),Y
1250 AND nextmask
1260 BNE topjmp
1270 TYA
1280 CLC
1290 ADC #8
1300 TAY
1310 LDA (addr),Y
1320 AND nextmask
1330 BNE topjmp
1340 TXA
1350 TAY
1360 LDA (addr),Y
1370 AND mask
1380 BEQ endtop
1390 .topjmp
1400 JMP doplot
1410 .endtop
1420 LDA row
1430 CMP #3
1440 BEQ addline
1450 .cantdotop
1460 LDX #12
1470 LDY #12
1480 LDA col
1490 BNE botrow
1500 LDY #4
1510 .botrow
1520 LDA (addr),Y
1530 AND nextmask
1540 BNE botjmp
1550 TYA
1560 CLC
1570 ADC #8
1580 TAY
1590 LDA (addr),Y
1600 AND nextmask
1610 BNE botjmp
1620 TXA
1630 TAY
1640 LDA (addr),Y
1650 AND mask
1660 BEQ endbot
1670 .botjmp
1680 JMP doplot
1690 .endbot
1700 LDA row
1710 BNE alldone
1720 LDA addr
1730 SEC
1740 SBC #linelength MOD 256
1750 STA addr2
1760 LDA addr+1
1770 SBC #linelength DIV 256
1780 STA addr2+1
1790 LDX #16
1800 LDY #16
1810 LDA col

```

```

1820 BNE lowest
1830 LDY #8
1840 .lowest
1850 LDA (addr2),Y
1860 AND nextmask
1870 BNE lowjmp
1880 TYA
1890 CLC
1900 ADC #8
1910 TAY
1920 LDA (addr2),Y
1930 AND nextmask
1940 BNE lowjmp
1950 TXA
1960 TAY
1970 LDA (addr2),Y
1980 AND mask
1990 BEQ endlow
2000 .lowjmp
2010 JMP doplot
2020 .endlow
2030 JMP alldone
2040 .addline
2050 LDA addr
2060 CLC
2070 ADC #((linelength-4) MOD 256
2080 STA addr2
2090 LDA addr+1
2100 ADC #((linelength-4) DIV 256
2110 STA addr2+1
2120 LDX #8
2130 LDY #8
2140 LDA col
2150 BNE highest
2160 LDY #0
2170 .highest
2180 LDA (addr2),Y
2190 AND nextmask
2200 BNE doplot
2210 TYA
2220 CLC
2230 ADC #8
2240 TAY
2250 LDA (addr2),Y
2260 AND nextmask
2270 BNE doplot
2280 TXA
2290 TAY
2300 LDA (addr2),Y
2310 AND mask
2320 BEQ alldone
2330 .doplot
2340 LDX colour
2350 LDA colours,X
2360 AND mask
2370 PHA
2380 LDY #10
2390 ORA (addr),Y
2400 STA (addr),Y
2410 INY
2420 PLA
2430 ORA (addr),Y
2440 STA (addr),Y
2450 .alldone
2460 DEC count
2470 LDA count
2480 CMP #255
2490 BNE jmploop
2500 DEC colcount
2510 BNE nochange
2520 LDA coldelay
2530 STA colcount
2540 LDA colour
2550 CLC
2560 ADC coladd
2570 CMP #7
2580 BCC lessthan7
2590 SBC #7
2600 .lessthan7
2610 STA colour
2620 .nochange
2630 DEC count+1
2640 LDA count+1
2650 CMP #255
2660 BNE jmploop
2670 DEC count+2
2680 LDA count+2
2690 CMP #255
2700 BEQ exit
2710 .jmploop
2720 BIT &FF
2730 BMI exit
2740 JMP loop
2750 .exit
2760 RTS
2770 :
2780 .masks
2790 EQU 42
2800 .nextmasks
2810 EQU 21
2820 EQU 42
2830 :
2840 .colours
2850 EQU &30:EQU &03:EQU &33
2860 EQU &0C:EQU &3C:EQU &0F:EQU &3
F
2870 ]
2880 scrlo=FNmem(128)
2890 scrhi=FNmem(128)
2900 NEXT
2910 FOR y=0 TO 127
2920 ad=&3000+(y DIV 4)*linelength+2*(y
MOD 4)-10
2930 scrlo7yad MOD 256

```

```

2940 scrhi7yad DIV 256
2950 NEXT
2960 ENDPROC
2970 :
2980 DEF FNzp(n)
2990 zp=zp+n
3000 =zp-n
3010 :
3020 DEF FNmem(n)
3030 P%=P%+n
3040 =P%-n
3050 :
3060 DEF FNmul5(ad)
3070 OPT pass
3080 LDA ad
3090 STA tmp
3100 LDA ad+1
3110 STA tmp+1
3120 LDA ad+2
3130 STA tmp+2
3140 LDA ad+3
3150 STA tmp+3
3160 ASL ad
3170 ROL ad+1
3180 ROL ad+2
3190 ROL ad+3
3200 ASL ad
3210 ROL ad+1
3220 ROL ad+2
3230 ROL ad+3
3240 LDA ad
3250 CLC
3260 ADC tmp
3270 STA ad
3280 LDA ad+1
3290 ADC tmp+1
3300 STA ad+1
3310 LDA ad+2
3320 ADC tmp+2
3330 STA ad+2
3340 LDA ad+3
3350 ADC tmp+3
3360 STA ad+3
3370 ]
3380 .pass
3390 :
3400 DEF PROCcoral
3410 REPEAT
3420 CLS
3430 FOR i=1 TO 10
3440 x=RND(160)-1
3450 y=RND(128)-1
3460 PLOT 69,x*8,y*8
3470 PLOT 69,x*8,y*8+4
3480 NEXT
3490 lcount=counter
3500 lrnd1=RND
3510 lrnd2=RND
3520 A%=RND(7)-1
3530 X%=RND(200)+50
3540 Y%=(RND(2)-1)*5+1
3550 CALL coral
3560 VDU 7
3570 IPGET
3580 UNTIL FALSE
3590 ENDPROC

```

Listing 5

```

10 REM >%.Biggest
20 REM By Dave Lawrence
30 REM For Archimedes only
40 REM (c) BAU Sep 91
50 :
60 PROCinit
70 arg$=FNgetargs
80 PROCreadargs(arg$)
90 IF help$ THEN
100 PRINT"Find large files and directo
ries"
110 PRINT"Keywords:"
120 PRINT"Upper case indicates allowab
le abbreviation"
130 FOR arg%=0 TO arg$-1
140 PROCp("-"arg$(arg$,0),arg$(arg$,2
))
150 NEXT
160 ELSE
170 PROCsetup
180 IF verbose% PRINTroot$;
190 PROCcount(root$)
200 IF verbose% PRINTSTRING$(LENroot$,
CHR$(127));
210 PROCresults
220 ENDIF
230 END
240 :
250 DATA 12
260 DATA Number,/e,"Number of objects
to display (default 30)"
270 DATA Type,types/k,"Filetype[s] to
count (separated by semicolons)"
280 DATA Exclude,/k,"Filetype[s] to ex
clude (separated by semicolons)"
290 DATA Directories,/s,"Count directo
ries rather than files"
300 DATA Applications,/s,"Count Risc 0
S applications (identified by !RunImage)
"
310 DATA Root,/k,"Set directory to sta
rt from (default $)"
320 DATA Single,/s,"Only count 'Root'
directory (don't recurse)"

```




```
330 DATA Format,/k,"Set file size form
at (Decimal, Hexadecimal, Textual)"
340 DATA Path,/s,"Print full pathnames
rather than file and path"
350 DATA Split,=sp/s,"Print pathnames
on a new line"
360 DATA Verbose,/s,"Display directori
es searched"
370 DATA Help,/s,"Display this help"
380 :
390 DEF PROCp(c$,h$)
400 SYS "OS_PrettyPrint",c$+STRING$(14
-LEN(c$,CHR$(31))+": "+h$+CHR$(10)+CHR$(13)+CHR
$(10)
410 ENDP
420 :
430 DEF FNgetargs
440 SYS "OS_GetEnv" TO A$
450 A$=FNlow(A$)
460 quit=INSTR(A$,"-quit")
470 A$=MID$(A$,quit+6)
480 spc=INSTR(A$," ")
490 A$=MID$(A$,spc+1)
500 A$=A$
510 :
520 DEF PROCinit
530 READ args$
540 DIM ftypes$(4)={PF,F},arg$(args-1,2),
form$(2),block 256
550 form$(1)="decimal","hexadecimal","t
extual"
560 dec%=0:hex%=1:text%=2:formats%=3
570 names=block+414
580 key$=""
590 FOR arg%=0 TO args-1
600 READ arg$(arg,0),arg$(arg,1),arg
$(arg,2)
610 IF key$<>" " key$+=", "
620 key$+=(FNlow(arg$(arg,0))+arg$(ar
g$,1))
630 NEXT
640 ENDP
650 :
660 DEF PROCreadargs(arg$)
670 ftypes$(0)=TRUE
680 SYS "OS_ReadArgs",key$,arg$,block,
4100
690 number% = FNval(0)
700 types% = FNval(1)
710 exclude% = FNval(2)
720 dirs% = FNval(3)
730 apps% = FNval(4)
740 root% = FNval(5)
750 single% = FNval(6)
760 format% = FNval(7)
770 path% = FNval(8)
780 split% = FNval(9)
790 verbose% = FNval(10)
800 help% = FNval(11)
810 ENDP
820 :
830 DEF FNval(arg$)
840 LOCAL val%
850 val%=block!(arg$*4)
860 IF RIGHT$(arg$(arg,1))="s" THEN =
(val%<>0)
870 =val%
880 :
890 DEF PROCsetup
900 flag%=(types%>0)-(exclude%>0)-app
s%-dirs%
910 files%=(types%>0) OR (exclude%>0)
OR (flag%>0)
920 IF flag%>1 ERROR 0,"Multiple sear
ch parameters"
930 IF number%>0 number%=30 ELSE numbe
r%=number%+1
940 IF types%>0 THEN
950 ftypes$(0)=FALSE
960 PROCExtracttypes(FNstr0(types%),TR
UE)
970 ENDP
980 IF exclude%>0 THEN
990 ftypes$(0)=TRUE
1000 PROCExtracttypes(FNstr0(exclude%),
FALSE)
1010 ENDP
1020 IF root%>0 THEN
1030 root$=" $"
1040 ELSE
1050 root$=FNstr0(root%)
1060 ENDP
1070 IF format%>0 THEN
1080 form$=FNlow(FNstr0(format%))
1090 format%=-1
1100 FOR i%=0 TO formats-1
1110 IF form$=LEFT$(form$(i),LEN(form$)
format%=i%
1120 NEXT
1130 IF format%<0 ERROR 0,"Unknown outp
ut format"
1140 ENDP
1150 IF dirs% single%=TRUE
1160 DIM file$(number%+1),path$(number%
+1),type$(number%+1),size$(number%+1)
1170 ENDP
1180 :
1190 DEF FNstr0(a$)
1200 a$=""
1210 WHILE ?a%<>0
1220 a$+CHR$(?a%)
1230 a$+1
1240 ENDP
1250 a$=a$
```

```
1260 :
1270 DEF PROCextracttypes(a$,flag%)
1280 LOCAL semi,type$,type
1290 a$+=""
1300 REPEAT
1310 semi=INSTR(a$,";")
1320 type$=LEFT$(a$,semi-1)
1330 IF LEFT$(type$,1)="g" THEN
1340 type$=EVAL(type$)
1350 ELSE
1360 SYS "OS_FSCntrol",31,type$ TO ,t
ype
1370 ENDP
1380 ftypes$(type)=flag%
1390 a$=MID$(a$,semi+1)
1400 UNTIL a$=""
1410 ENDP
1420 :
1430 DEF FNfiletype(t%)
1440 LOCAL a,b,blk
1450 DIM blk 8
1460 SYS "OS_FSCntrol",18,,t TO ,a,b
1470 blk=a:blk+4:b:blk+8=13
1480 =blk
1490 :
1500 DEF FNlow(i$)
1510 LOCAL i%,c%,o$
1520 FOR i%=1 TO LEN(i$)
1530 c%=ASC(MID$(i$,i,1))
1540 IF c%>="A" AND c%<="Z" c%=c%
+32
1550 o$+CHR$(c%)
1560 NEXT
1570 =o$
1580 :
1590 DEF PROCcount(dir$)
1600 LOCAL ptr,len
1610 ptr=0
1620 REPEAT
1630 SYS "OS_GBPB",10,dir$,block,1,ptr,
50 TO ,,,ptr
1640 IF ptr=>0 THEN
1650 name$=FNstr0(name)
1660 CASE block+410 OF
1670 WHEN 1:
1680 IF files% THEN
1690 ftype$=(blk AND &000FFFF0)>>8
1700 IF ftypes%(ftype%) THEN
1710 len%=block+48
1720 PROCinsert(name$,dir$,FNfiletype(f
type%),len%)
1730 ENDP
1740 ENDP
1750 WHEN 2:
1760 IF dirs% OR apps% THEN
1770 IF apps% THEN
1780 SYS "OS_File",5,dir$+",".name$+
RunImage" TO count%
1790 ELSE
1800 count%+=TRUE
1810 ENDP
1820 IF count% THEN
1830 SYS "OS_FSCntrol",28,dir$+",".nam
e$,,1 TO ,bytes,files
1840 PROCinsert(name$,dir$,"",bytes)
1850 ENDP
1860 ENDP
1870 IF NOT single% THEN
1880 IF verbose% PRINT".":name$;:len=LE
N(name$)
1890 PROCcount(dir$+",".name$)
1900 IF verbose% PRINTSTRING$(len+1,CHR
$(127))
1910 ENDP
1920 ENDCASE
1930 ENDP
1940 UNTIL ptr=-1
1950 ENDP
1960 :
1970 DEF PROCinsert(file$,path$,type$,s
ize)
1980 IF size>size%(number%) THEN
1990 pos%=number%
2000 REPEAT
2010 pos%+=1
2020 UNTIL pos%=0 OR size<size%(pos%)
2030 pos%+=1
2040 FOR i%=number% TO pos% STEP -1
2050 file$(i+1)=file$(i%)
2060 path$(i+1)=path$(i%)
2070 type$(i+1)=type$(i%)
2080 size$(i+1)=size$(i%)
2090 NEXT
2100 file$(pos+1)=file$
2110 path$(pos+1)=path$
2120 type$(pos+1)=type$
2130 size$(pos+1)=size$
2140 ENDP
2150 ENDP
2160 :
2170 DEF PROCresults
2180 i%=1
2190 WHILE i%<=number% AND file$(i%)<>
"
2200 CASE format% OF
2210 WHEN dec%:
2220 size$=STR$(size$(i%))
2230 WHEN hex%:
2240 size$="&" + RIGHT$(STRING$(8,"0")+ST
R$(size$(i%),8)
2250 WHEN text%:
2260 SYS "OS_ConvertFixedFileSize",size
$(i%),block,256
2270 size$=FNstr0(block)
```

```
2280 ENDCASE
2290 size$=RIGHT$(STRING$(12," ") +size$
,12)+""
2300 IF files% THEN
2310 type$=type$(i%)+""
2320 ELSE
2330 type$=""
2340 ENDP
2350 IF path% THEN
2360 path$=path$(i%)+". "+file$(i%)
2370 file$=""
2380 ELSE
2390 file$=LEFT$(file$(i%)+STRING$(12,"
"),12)
2400 path$=path$(i%)
2410 ENDP
2420 IF split% AND files% THEN
2430 PRINTsize$,type$,SPC14,file$,path$
2440 ELSE
2450 PRINTsize$,file$,type$,path$
2460 ENDP
2470 i%+=1
2480 ENDP
2490 ENDP
```

Listing 6

```
10 REM Big8 (Info3b)
20 REM Show biggest files
30 REM by Dave Acton
40 REM for B/B+/M/C/E
50 REM (c) BAU September 1991
60 :
70 MODE 7
80 VDU 23,8202;0;0;0;
90 *FX 4,1
100 PROCtitle("BAU File & Directory Co
unter")
110 maxfiles%=20
120 fdatasize%=100
130 DIM fdatat% maxfiles%,fdatsize%
140 DIM next%(maxfiles%)
150 DIM temp% &100,q% &100
160 DIM m$(10)
170 DIM mtype$(20),func$(20),sel%(20)
180 func%=0
190 REPEAT
200 READ type$(func%)
210 i%=INSTR(type$(func%)," ")
220 IF i%>0 func$(func%)=LEFT$(type$(f
unc%),i%-1) ELSE func$(func%)=type$(func
%)
230 typemen$=typemen$+"," +type$(func%)
240 func%=func%+1
250 UNTIL type$(func%-1)="Other"
260 func%=func%-1
270 seldir$=""
280 which%=0
290 verbose%=FALSE
300 recur%=TRUE
310 ON ERROR PROCerr
320 REPEAT
330 m$="Start search,Select root,Selec
t type, "+FNtick(verbose%)+",Verbose, "+FNt
ick(recur%)+",Recurse,Quit"
340 choice%=FNmenu(m$,choice%,"Dir: "+
FNname(seldir$,30))
350 IF choice%=0 PROCbiggest(seldir$,5
-15*(NOT verbose%)):PROCgetakey
360 IF choice%=1 PROCgetdir
370 IF choice%=2 PROCtypemenu
380 IF choice%=3 verbose%=NOT verbose%
390 IF choice%=4 recur%=NOT recur%
400 UNTIL choice%=5
410 *FX 4,0
420 MODE 7
430 ENDP
440 :
450 DEF PROCerr
460 IF ERR=17 ENDP
470 CLS
480 PRINTCHR$(129)+CHR$(136)+Error: "CHR$(13
7);
490 REPORT
500 PROCgetakey
510 ENDP
520 :
530 DEF PROCgetdir
540 REPEAT
550 CLS
560 PRINT" Enter directory to search:"
570 INPUT ">"seldir$
580 UNTIL FNtype(seldir$)=2
590 ENDP
600 :
610 DEF PROCtypemenu
620 LOCAL choice%,m$,i%
630 choice%=0
640 REPEAT
650 m$=FNtick(which%=0)+",All files,"
660 m$=m$+FNtick(which%=1)+",Directory,
"
670 FOR i%=0 TO func%-1
680 m$=m$+FNtick(which%=0 OR (which%=2
AND sel%(i%))) +type$(i%)+", "
690 NEXT
700 m$=m$+Main menu"
710 choice%=FNmenu(m$,choice%,"Select
type(s) to search for")
720 :
730 IF choice%>2 which%=choice%
```

```
740 IF choice%>2 AND choice%=func%+2
sel%(choice%-2)=NOT sel%(choice%-2):whic
h%=2
750 UNTIL choice%=func%+2
760 ENDP
770 :
780 DEF FNtick(cond%)
790 IF cond% THEN ="#1" ELSE ="#0"
800 :
810 DEF PROCgetakey
820 PROCstatus("Press a key to return
to menu...")
830 *FX 15,1
840 wait=GET
850 ENDP
860 :
870 DEF FNyn(yn%)
880 IF yn%=0 THEN =" " ELSE =" ] "
890 :
900 DEF FNmenu(men$,choice%,stat%)
910 items%=0
920 REPEAT
930 i%=INSTR(men$," ")
940 IF i%=0 m$=men$:men$="" ELSE m$=LE
FT$(men$,i%-1):men$=MID$(men$,i%,1)
950 IF LEFT$(m$,1)="#" THEN m$=FNyn(VA
LMID$(m$,2))+MID$(m$,3) ELSE m$="" +m$
960 m$(items%)=m$
970 items%=items%+1
980 UNTIL men$=""
990 VDU 28,0,24,39,3,12
1000 PROCstatus(stat%)
1010 PROCc("Cursor keys move pointer",1
6)
1020 PROCc("RETURN selects",18)
1030 REPEAT
1040 VDU 30
1050 FOR i%=0 TO items%-1
1060 IF choice%=i% VDU 135 ELSE VDU 130
1070 PRINT SPC5;m$(i%)
1080 NEXT
1090 key%=GET
1100 IF key%=138 choice%=(choice%+1) MO
D items%
1110 IF key%=139 choice%=(choice%+item
s%-1) MOD items%
1120 UNTIL key%=13
1130 =choice%
1140 :
1150 DEF PROCtitle(t$)
1160 FOR i%=0 TO 1
1170 PRINTTAB(0,i%)SPC40
1180 PRINTTAB(0,i%)CHR$(131)+CHR$(141)+SPC(18
-LEN(t$)/2)+t$
1190 NEXT
1200 ENDP
1210 :
1220 DEF PROCt(y,y%)
1230 PRINTTAB(20-LEN(t$)/2,y%)t$;
1240 ENDP
1250 :
1260 DEF PROCbiggest(d$,tofind%)
1270 CLS
1280 tpos%=0
1290 PROCstatus("Searching...")
1300 found%=0
1310 list%=-1
1320 PROCshowlist
1330 z%=FNsearch(d$,0,FALSE)
1340 PROCstatus("Search complete")
1350 ENDP
1360 :
1370 DEF FNsearch(f$,depth%,dirflag%)
1380 LOCAL i%,f%,done%,dirsize%
1390 IF depth%>1 AND NOT (recur% OR whi
ch%=1) THEN =0
1400 f%=FNtype(f$)
1410 IF f%=1 THEN =FNfile(f$)
1420 dirsize%=0
1430 IF depth%=1 AND which%=1 dirflag%=
TRUE
1440 PROCseldir(f$)
1450 i%=0
1460 REPEAT
1470 PROCgpbp(0,temp%,1,i%)
1480 done%=(q%>15)>0
1490 IF NOT done% dirsize%=dirsize%+FNs
earch(f$+"," +FNtrng(temp%),depth%+1,di
rflag%):PROCseldir(f$):i%=i%+1
1500 UNTIL done%
1510 IF depth%=1 AND which%=1 PROCinser
t(0,0,dirsize%,-2,f$)
1520 =dirsize%
1530 :
1540 DEF PROCseldir(d$)
1550 PROCstatus("DIR "+FNname(d$,34))
1560 OSCLI("DIR "+d$)
1570 ENDP
1580 :
1590 DEF PROCstatus(t$)
1600 PRINTTAB(0,21)t$;SPC(39-LEN(t$));
1610 ENDP
1620 :
1630 DEF FNstring(s%)
1640 LOCAL p$,done%
1650 p$=""
1660 s%=s%+1
1670 REPEAT
1680 done%=TRUE
1690 IF p%>=IF ?(p%-1)=32 p%=p%-1:don
e%=FALSE
1700 UNTIL done%
1710 ?p%=13
1720 =s%
```



```

1730 :
1740 DEF FNfile(f$)
1750 LOCAL load%,exec%,size%,i%,j%,k%,f
t%
1760 load%=q%/2
1770 exec%=q%/6
1780 size%=q%/10
1790 IF dirflag% THEN =size%
1800 ft%=FNvalidfile(load% AND &FFFF,ex
ec% AND &FFFF,size%)
1810 IF ft%=-3 THEN =-size%
1820 PROCInsert(load%,exec%,size%,ft%,f
$)
1830 =-size%
1840 :
1850 DEF PROCInsert(load%,exec%,size%,f
t%,f$)
1860 IF found%=0 PROCaddfile(found%,loa
d%,exec%,size%,ft%,f$):list%=found%:next
%(list%)=-1:found%=1:PROCshowlist:ENDPRO
C
1870 i%=list%
1880 j%=-1
1890 REPEAT
1900 IF size%!(FNa(i%)+8) THEN j%=i%:i
%=next%(i%)
1910 UNTIL i%=-1 OR size%<!(FNa(i%)+8)
1920 IF j%=-1 AND found%<tofind% ENDPRO
C
1930 IF j%=-1 PROCaddfile(found%,load%,
exec%,size%,ft%,f$):next%(found%)=list%:
list%=found%:found%<tofind%:PROCshowlis
t:ENDPROC
1940 IF found%<tofind% AND j%=list% PRO
Caddfile(list%,load%,exec%,size%,ft%,f$):
PROCshowlist:ENDPROC
1950 IF found%<tofind% k%=list%:list%=n
ext%(list%) ELSE k%=found%:found%=found%
+1
1960 PROCaddfile(k%,load%,exec%,size%,f
t%,f$)
1970 next%(j%)=k%
1980 next%(k%)=i%
1990 PROCshowlist
2000 ENDPROC
2010 :
2020 DEF PROCshowlist
2030 VDU 30
2040 IF list%=-1 PRINTSPC3"None found y
et..." :ENDPROC
2050 IF verbose% PROCvlist ELSE PROCcli
st
2060 ENDPROC
2070 :
2080 DEF PROCclist
2090 LOCAL i%,a%,v%
2100 v%=found%-1
2110 i%=list%
2120 REPEAT
2130 a%=FNa(i%)
2140 PRINTTAB(0,v%):RIGHT$(" " +STR
$(a%(8),7))
2150 PRINT" " $(FNa(i%)+16)
2160 i%=next%(i%)
2170 v%=v%-1
2180 UNTIL i%=-1
2190 ENDPROC
2200 :
2210 DEF PROCvlist
2220 LOCAL i%,a%,v%,ft%
2230 v%=found%-1
2240 i%=list%
2250 REPEAT
2260 a%=FNa(i%)
2270 PRINTTAB(0,v%+4)$(FNa(i%)+16)
2280 ft%=(FNa(i%)+12)
2290 IF ft%<-2 PRINT FNhex(i%):" " :FN
hex(a%(4)):" "
2300 PRINT RIGHT$(STRING$(10," ") +FNsiz
e(a%(8),10)):" " :FNtpestring(ft%)
2310 i%=next%(i%)
2320 v%=v%-1
2330 UNTIL i%=-1
2340 ENDPROC
2350 :
2360 DEF FNsize(s%)
2370 IF s%<1000 THEN =STR$(s% DIV 400
0)+"K"
2380 =STR$(s%)+ " bytes"
2390 :
2400 DEF FNfname(f$,i%)
2410 IF LEN(f$)<1% THEN =LEFT$(f$+STRI
NG$(1%," " ),1%)
2420 = "..."+RIGHT$(f$,1%-3)
2430 :
2440 DEF PROCaddfile(i%,load%,exec%,siz
e%,ft%,f$)
2450 LOCAL a%
2460 a%=FNa(i%)
2470 i%=load%
2480 a%&4=exec%
2490 a%&8=size%
2500 a%&12=ft%
2510 $(a%+16)=FNfname(f$,30-36+verbose%
)
2520 ENDPROC
2530 :
2540 DEF FNa(n%)
2550 =filedat%+fdatsize%*n%
2560 :
2570 DEF PROCgbpb(handle%,data%,bytes%,
pointer%)
2580 ?q%=handle%
2590 q%&1=data%

```

```

2600 q%&5=bytes%
2610 q%&9=pointer%
2620 z%=FNcall(&FDD1,q%,8)
2630 ENDPROC
2640 :
2650 DEF FNtype(f$)
2660 =FNosfile(5,f$)
2670 :
2680 DEF FNosfile(A%,f$)
2690 $temp%=f$
2700 i%=temp%
2710 =FNcall(&FDD,q%,A%)
2720 :
2730 DEF FNcall(r%,q%,A%)
2740 K%=q% MOD 256
2750 Y%=q% DIV 256
2760 =USR(r%) AND &FF
2770 :
2780 DEF FNhex(n%)
2790 =RIGHT$("00000000"+STR$~n%,8)
2800 :
2810 DEF PROCerror(err$)
2820 PRINTerr$
2830 ENDPROC
2840 :
2850 DEF FNvalidfile(load%,exec%,size%)
2860 LOCAL i%,valid%
2870 IF which%=0 THEN =-1
2880 i%=0
2890 REPEAT
2900 IF sel%(i%) valid%=EVAL("FN"+func$
(i%)+"(load%,exec%,size%)") ELSE valid%=
FALSE
2910 IF NOT valid% i%=i+1
2920 UNTIL valid% OR (i%=func%)
2930 IF NOT valid% i%=-3
2940 =i%
2950 :
2960 DEF FNscreen(load%,exec%,size%)
2970 =(load%&3000 AND size%&5000) OR
(load%&5800 AND size%&2800)
2980 :
2990 DEF FNteletext(load%,exec%,size%)
3000 =(load%&7C00)
3010 :
3020 DEF FNexec(load%,exec%,size%)
3030 =(load%&0 AND exec%&FFFF)
3040 :
3050 DEF FNrom(load%,exec%,size%)
3060 =(load%&8000)
3070 :
3080 DEF FNbasic(load%,exec%,size%)
3090 =(load% AND &FF)=0 AND load%&=800
AND load%&2000 AND (exec%&load% OR exe
c%&8000)
3100 :
3110 DEF FNkeys(load%,exec%,size%)
3120 =(load%&B00 AND size%&100)
3130 :
3140 DEF FNfont(load%,exec%,size%)
3150 =(load%&C00 AND size%&100)
3160 :
3170 DEF FNtpestring(t%)
3180 IF t%=-2 THEN ="Directory"
3190 IF t%=-1 THEN ="File"
3200 =type$(t%)
3210 :
3220 DATA Screen,Teletext
3230 DATA Exec,Rom,Basic
3240 DATA FKeys,Font
3250 DATA Other

```

Listing 7

```

10 REM >LdPicARM (Info4a)
20 REM By Dave Lawrence
30 REM For Archimedes only
40 REM (c) BAU Sep 91
50 :
60 PROCinit
70 PROCcode
80 SYS "OS_File",10,"%LdPic",&FFC,;c
ode,P%
90 END
100 :
110 DEF PROCinit
120 DIM code 2000
130 himem=4
140 count=5
150 countbits=6
160 bitareq=7
170 step=8
180 passcount=9
190 screen=10
200 bits=11
210 ws=12
220 sp=13
230 link=14
240 pc=15
250 ENDPROC
260 :
270 DEF PROCcode
280 FOR pass%=0 TO 2 STEP 2
290 P%code
300 OPT pass%
310 STMPD (sp),link
320 STR sp,stack
330 MOV R2,ws
340 LDRB R0,[R1]
350 CMP R0,#32
360 BGE copyname
370 LDMPD (sp),link
380 ADR R0,synerr

```

```

390 ORRS pc,link,#1<<28
400 .synerr EQU 16
410 EQUUS "Syntax: *LdPic <SvPic Scr
een>"+CHR$0
420 ALIGN
430 :
440 .copyname
450 LDRB R0,[R1],#1
460 STRB R0,[R2],#1
470 CMP R0,#32
480 BGE copyname
490 MOV R0,#40
500 MOV R1,ws
510 MOV R2,#0
520 SWI "XOS_Find"
530 LDMPVSD (sp),pc
540 CMP R0,#0
550 BNE okhandle
560 MOV R0,#19
570 MOV R1,ws
580 MOV R2,#0
590 SWI "XOS_File"
600 LDMPD (sp),pc
610 .okhandle
620 STR R0,handle
630 MOV bits,#1
640 MOV R2,#8
650 BL multiread
660 MOV bitareq,R0
670 MOV R2,#8
680 BL multiread
690 STR R0,mode
700 CMP R0,#7
710 BLT realmode
720 LDMPD (sp),link
730 ADR R0,nastymode
740 ORRS pc,link,#1<<28
750 .nastymode
760 EQU 25
770 EQUUS "Unusable mode"+CHR$0
780 ALIGN
790 :
800 .realmode
810 ADR R1,msizes
820 LDR himem,[R0,ASL #2]
830 SWI 100+22
840 SWI 100+12
850 SWI "XOS_RemoveCursors"
860 ADR R0,scr
870 ADR R1,scr
880 SWI "XOS_ReadVduVariables"
890 MOV R1,#15
900 .palloop
910 SWI 100+19
920 MOV R0,R1
930 SWI "OS_WriteC"
940 MOV R2,#4
950 BL multiread
960 SWI "OS_WriteC"
970 SWI 100+0
980 SWI 100+0
990 SWI 100+0
1000 SUBS R1,R1,#1
1010 BPL palloop
1020 MOV R2,#8
1030 BL multiread
1040 MOV step,R0
1050 MOV R2,#8
1060 BL multiread
1070 MOV countbits,R0
1080 MOV passcount,step
1090 .screenpass
1100 MOV screen,passcount
1110 SUB screen,screen,#1
1120 STR screen,scr1
1130 MOV R0,#0
1140 STR R0,scrx
1150 STR R0,scry
1160 .getbit MOV R2,#1
1170 BL multiread
1180 CMP R0,#0
1190 BEQ single
1200 MOV R2,countbits
1210 BL multiread
1220 MOV count,R0
1230 MOV R2,bitareq
1240 BL multiread
1250 .repeat BL writeR0
1260 BL updatescr
1270 SUBS count,count,#1
1280 BNE repeat
1290 B until
1300 .single MOV R2,bitareq
1310 BL multiread
1320 BL writeR0
1330 BL updatescr
1340 .until CMP screen,himem
1350 BLT getbit
1360 SUBS passcount,passcount,#1
1370 BNE screenpass
1380 MOV R0,#0
1390 LDR R1,handle
1400 SWI "XOS_Find"
1410 LDMPD (sp),pc
1420 :
1430 .updatescr
1440 STMPD (sp),R0-R4,link
1450 ADD screen,screen,step
1460 LDR R0,mode
1470 CMP R0,#4
1480 MOVLT R4,#1
1490 MOVGE R4,#2
1500 ADR R3,scrinfo
1510 LDmia (3),R0,R1,R2

```

```

1520 ADD R2,R2,step
1530 CMP R2,#8
1540 SUBGE R2,R2,#8
1550 ADDGE R0,R0,R4
1560 CMPGE R0,#80
1570 SUBGE R0,R0,#80
1580 ADDGE R1,R1,#1
1590 STMIA (3),R0,R1,R2
1600 LDMPD (sp),R0-R4,pc
1610 :
1620 .writeR0
1630 STMPD (sp),R1-R4,link
1640 LDR R1,scr1
1650 LDR R2,scr2
1660 ADD R1,R1,R2,ASL #3
1670 LDR R2,scr3
1680 ADD R2,R2,R1,ASL #6
1690 ADD R2,R2,R1,ASL #8
1700 LDR R1,scrx
1710 ADD R2,R2,R1,ASL #2
1720 LDR R1,mode
1730 ADD pc,pc,R1,ASL #2
1740 EQU 0
1750 B mode0
1760 B mode1
1770 B mode2
1780 B mode0
1790 B mode4
1800 B mode1
1810 B mode4
1820 :
1830 .mode0 MOV R4,#640
1840 .mode0loop
1850 MOV R3,#0
1860 TST R0,R4,ASL #1
1870 ORRNE R3,R3,#1
1880 TST R0,R4
1890 ORRNE R3,R3,#10
1900 STRB R3,[R2],#1
1910 MOV R4,R4,LSR #2
1920 BNE mode0loop
1930 LDMPD (sp),R1-R4,pc
1940 :
1950 .mode1 MOV R4,#608
1960 .mode1loop
1970 MOV R3,#0
1980 TST R0,R4,LSL #4
1990 ORRNE R3,R3,#622
2000 TST R0,R4
2010 ORRNE R3,R3,#11
2020 STRB R3,[R2],#1
2030 CMP R1,#5
2040 STREQB R3,[R2],#1
2050 MOV R4,R4,LSR #1
2060 BNE mode1loop
2070 LDMPD (sp),R1-R4,pc
2080 :
2090 .mode2 MOV R4,#2
2100 .mode2loop
2110 MOV R3,#0
2120 TST R0,R4,LSL #6
2130 ORRNE R3,R3,#688
2140 TST R0,R4,LSL #4
2150 ORRNE R3,R3,#644
2160 TST R0,R4,LSL #2
2170 ORRNE R3,R3,#622
2180 TST R0,R4,LSL #0
2190 ORRNE R3,R3,#11
2200 STRB R3,[R2],#1
2210 STRB R3,[R2],#1
2220 MOV R4,R4,LSR #1
2230 BNE mode2loop
2240 LDMPD (sp),R1-R4,pc
2250 :
2260 .mode4 MOV R4,#60
2270 .mode4loop
2280 MOV R3,#0
2290 TST R0,R4
2300 ORRNE R3,R3,#11
2310 STRB R3,[R2],#1
2320 MOV R4,R4,LSR #1
2330 BNE mode4loop
2340 LDMPD (sp),R1-R4,pc
2350 :
2360 .multiread
2370 STMPD (sp),R1,R3,R4,link
2380 MOV R3,#0
2390 MOV R4,R2
2400 LDR R0,flyte
2410 .mrlloop SUBS bits,bits,#1
2420 BNE gotsomebits
2430 LDR R1,handle
2440 SWI "XOS_Boet"
2450 LDRVS sp,stack
2460 LDMPVSD (sp),pc
2470 MOV bits,#8
2480 MOV R0,R0,ASL #24
2490 .gotsomebits
2500 MOV R0,R0,LSL #1
2510 MOV R3,R3,RX
2520 SUBS R4,R4,#1
2530 BNE mrlloop
2540 STR R0,flyte
2550 RSB R2,R2,#32
2560 MOV R0,R3,LSR R2
2570 LDMPD (sp),R1,R3,R4,pc
2580 :
2590 .msizes EQU 5000
2600 EQU 5000
2610 EQU 5000
2620 EQU 5000
2630 EQU 5000
2640 EQU 5000
2650 EQU 5000

```




```
2660 EQU 0
2670 :
2680 .scr EQU 148
2690 EQU -1
2700 .stack EQU 0
2710 .handle EQU 0
2720 .fbyte EQU 0
2730 .mode EQU 0
2740 .scrinfo
2750 .scr EQU 0
2760 .sry EQU 0
2770 .scr1 EQU 0
2780 ]
2790 NEXT
2800 ENDP
```

Listing 8

```
10 REM >Wave (Info5a)
20 REM by J S Graley
30 REM for Archimedes only
40 REM (c) BAU Sep 91
50 :
60 MODE 12
70 colsh=4
80 xres=640:ymul=2
90 yres=256:ymul=4
100 height=70
110 width=152
120 skipsh=1
130 repsh=0
140 colour=4
150 DIM memory 20000
160 DIM voice(31)
170 DIM newfill(31),newgoff(31)
180 DIM oldfill(31),oldgoff(31)
190 SYS "Sound_Configure",1,416,48 TO
D%,D%,D%,level1
200 VOICES 8
210 FOR pass=0 TO 2 STEP 2
220 P%memory
230 [OPT pass
240 .plot
250 LDR R12,temp
260 LDR R7,temp+4
270 STR R0,temp
280 ADR R6,data
290 ADD R6,R6,#1024
300 ADD R6,R6,R7,ASL #11
310 LDMIA R6!,{R0-R3}
320 MOV R11,R11,ASL #skipsh
330 MLA R4,R11,R3,R12
340 MOV R9,R1,ASL R2
350 LDR R7,temp
360 CMP R7,#602
370 BLE flush
380 ADR R7,data
390 .plotloop
400 LDRB R3,[R12],R11
410 LDR R3,[R7,R3,ASL #2]
420 SUB R8,R0,R3
430 LDR R2,[R6]
440 LDR R3,[R2]
450 EOR R3,R3,R9
460 STR R3,[R2]
470 LDR R3,[R8]
480 EOR R3,R3,R9
490 STR R3,[R8]
500 STR R8,[R6],#4
510 LDRB R3,[R12],R11
520 LDR R3,[R7,R3,ASL #2]
530 SUB R8,R0,R3
540 LDR R2,[R6]
550 LDR R3,[R2]
560 EOR R3,R3,R9,ROR #32-(colsh<<repsh)
570 STR R3,[R2]
580 LDR R3,[R8]
590 EOR R3,R3,R9,ROR #32-(colsh<<repsh)
600 STR R3,[R8]
610 STR R8,[R6],#4
620 MOV R9,R9,ROR #32-(colsh<<repsh)
h)*2
630 TEST R9,#(1<<colsh)-1
640 ADDNE R0,R0,#4
650 CMP R12,R4
660 BLT plotloop
670 LDR R0,temp
680 LDMFD R13!,{PC}
690 .flush
700 LDR R8,[R6]
710 LDR R3,[R8]
720 EOR R3,R3,R9
```

Juggling

Listing 1

```
10 REM >MakeJugSpr (Juggle1)
20 REM by Nick Craig-Wood
30 REM for Arc only
40 REM (c) BAU Sep 91
50 :
60 MODE 13
70 OFF
80 :
90 spriteareasize=8*1024
100 spriteop=62E
110 DIM spritearea spriteareasize
```

```
730 STR R3,[R8]
740 ADR R8,dump
750 STR R8,[R6],#4
760 MOV R9,R9,ROR #32-(colsh<<repsh)
h)
770 ADD R12,R12,R11
780 CMP R12,R4
790 BLT flush
800 MOV R0,R7
810 LDMFD R13!,{PC}
820 ]
830 FOR H%=0 TO 31
840 voice(H%)=(level1+640+H%*4)
850 IF voice(H%)<>0 THEN
860 oldfill(H%)=voice(H%)+(1voice(H%)
AND &FFFFFF)*4+8
870 [OPT pass
880 .newfill(H%)
890 STR R12,temp
900 STR R7,temp+4
910 ADR R0,ind
920 STMPD R13!,{R0}
930 B oldfill(H%)
940 ]
950 ENDIF
960 NEXT H%
970 [OPT pass
980 .ind
990 B plot
1000 ]
1010 FOR H%=0 TO 31
1020 IF voice(H%)<>0 THEN
1030 oldgoff(H%)=voice(H%)+12*(voice(H%)
AND &FFFFFF)*4+8
1040 [OPT pass
1050 .newgoff(H%)
1060 STR R12,temp
1070 STR R7,temp+4
1080 ADR R0,ind
1090 STMPD R13!,{R0}
1100 B oldgoff(H%)
1110 ]
1120 ENDIF
1130 NEXT H%
1140 [OPT pass
1150 .scr
1160 EQU 148
1170 EQU -1
1180 .temp
1190 EQU 0
1200 EQU 0
1210 .dump
1220 EQU 0
1230 .data
1240 ]
1250 NEXT pass
1260 FOR N%=0 TO 255
1270 P%((N%*4)=((FNlin(N%))>>16)+32768)
*height>>16)*colsh*xres/8
1280 NEXT N%
1290 SYS "OS_ReadVduVariables",scr,scr
1300 screen=scr
1310 COLOUR 1,192,0,32
1320 COLOUR 2,128,240,0
1330 COLOUR 6,128,240,0
1340 FOR N%=0 TO 3
1350 COLOUR N%+8,0,16,48+16*N%
1360 COLOUR N%+12,240,0,64
1370 NEXT N%
1380 VDU 28,0,31,79,20
1390 FOR C%=1 TO 8
1400 READ X%,Y%,S%
1410 FOR N%=0 TO 3
1420 GCOL 11-N%
1430 RECTANGLE FILL X%*xmul,(yres-height
t*N%/8-Y%-1)*ymul,width*xmul,height*ymul
*(1-N%/4)
1440 NEXT N%
1450 VDU 5:GCOL 2
1460 MOVE (X%*5)*xmul,(yres-Y%+9)*ymul
1470 PRINT"ch.",C%;
1480 VDU 4:GCOL 1
1490 RECTANGLE X%*xmul,(yres-Y%-1)*ymul
,width*xmul,height*ymul
1500 cw=data+1024+2048*(C%-1)
1510 FOR N%=0 TO 2044 STEP 4
1520 cw/N%#dump
1530 NEXT N%
1540 cw10=screen+colsh*(xres*Y%+X%)/8
1550 cw14=colour*((1<<colsh)*(1<<repsh)
-1)/((1<<colsh)-1)
1560 cw18=(colsh*X%) MOD 32
1570 cw12=width>>repsh
1580 OSLCI "CHANNELVOICE "+STR$C%+" "+S
TR$C%
1590 STEREO C%,S%
```

```
1600 NEXT C%
1610 FOR H%=0 TO 31
1620 IF voice(H%)<>0 THEN
1630 P%=voice(H%)
1640 [OPT 2:B newfill(H%):]
1650 P%=voice(H%)+12
1660 [OPT 2:B newgoff(H%):]
1670 ENDIF
1680 NEXT H%
1690 C%=0
1700 *FX 225,2
1710 *FX 229,1
1720 OFF
1730 pitcha$=" ZzSaXxD4CcVvGgBhHnNjMm
<,Ll>.:;?/""""
1740 pitchb$=" qQ00wW3#eErR5%tT6"yY7&u
iI9(oO0)pP{[+=]}E=|'"
1750 channel%=1
1760 PRINT"fl-f8 selects channel, ESCAP
E quits, TAB flushes channel"
1770 PRINT"other keys play notes"
1780 PRINT"i9 exits to 'shell' - use wi
th care!"
1790 REPEAT
1800 PRINTTAB(0,4)"Channel: ";channel%
1810 i%INKEY(0)
1820 IF i%=0 i%=256-GET
1830 IF i%=9 OSLCI "CHANNELVOICE "+STR$
channel%+" 0":OSCLI "CHANNELVOICE "+STR$
channel%+" "+STR$channel%
1850 IF i%=&181 AND i%=&188 THEN
1860 channel%=i%-&180
1870 ELSE
1880 p%=INSTR(pitcha$,CHR$(i%)) DIV 2
1890 IF p%=0 THEN
1900 p%=INSTR(pitchb$,CHR$(i%)) DIV 2
1910 IF p%>0 p%+=12
1920 ENDIF
1930 IF p%>0 THEN
1940 SOUND channel%,&17F,53+4*p%,-1
1950 ENDIF
1960 ENDIF
1970 UNTIL i%=27 OR i%=&189
1980 *FX 225,1
1990 *FX 229
2000 IF i%=&189 THEN CLS:PROCins("PAGE=
"+STR$(END+256)):PROCins("NEW"):END
2010 FOR H%=0 TO 31
2020 IF voice(H%)<>0 THEN
2030 P%=voice(H%)
2040 [OPT 2:B oldfill(H%):]
2050 P%=voice(H%)+12
2060 [OPT 2:B oldgoff(H%):]
2070 ENDIF
2080 NEXT H%
2090 END
2100 :
2110 DEF PROCins(i$)
2120 FOR i%=1 TO LEN(i$)
2130 SYS "OS_Byte",138,0,ASCMD$(i$,i%)
2140 NEXT
2150 SYS "OS_Byte",138,0,13
2160 ENDP
2170 :
2180 DEF FNlin(L%)
2190 neg=-(L% AND 1)
2200 L%=L% AND NOT 1
2210 E%=&3FFFFFFF
2220 J%=&40000000
2230 J%=J%/2
2240 SYS"Sound_SoundLog",E% TO R%
2250 IF R%>L% THEN E%-=J%:GOTO 2230
2260 IF R%<L% THEN E%+=J%:GOTO 2230
2270 IF neg THEN E%-=E% ELSE E%=E%
2280 :
2290 DATA 0,83,-120
2300 DATA 160,83,-40
2310 DATA 320,83,-40
2320 DATA 480,83,-120
2330 DATA 0,158,-120
2340 DATA 160,158,-40
2350 DATA 320,158,-40
2360 DATA 480,158,-120
```

Listing 9

```
10 REM >FontBoxes (Info6a)
20 REM by Dave Lawrence
30 REM For Archimedes only
40 REM (c) BAU September 1991
50 :
60 MODE 12:OFF
70 font$="Corpus.Medium"
80 size%=50
```

```
90 SYS "Font_FindFont",font$,size%*1
6,size%*16,0,0 TO handle
100 SYS "Font_SetFont",handle
110 SYS "Font_SetPalette",8,15,-7,0,&
FFFFFF00
120 char=32
130 x=0
140 y=920
150 REPEAT
160 SYS "Font_SetFontColours",handle,8
,15,-6
170 SYS "Font_Paint",CHR$char,%000100
00,x,y
180 SYS "Font_StringBox",CHR$char TO
,minx,miny,maxx,maxy
190 PROCrect(minx,miny,maxx,maxy,1)
200 SYS "Font_CharBox",handle,char TO
,minx,miny,maxx,maxy
210 PROCrect(minx,miny,maxx,maxy,2)
220 x=x+6
230 IF x>1200 x=0:y=y-128
240 char=char+1
250 UNTIL char=127
260 SYS "Font_LoseFont",handle
270 END
280 :
290 DEF PROCrect(x1,y1,x2,y2,c)
300 SYS "Font_Convertto00",x1,y1 TO
,x1,y1
310 SYS "Font_Convertto00",x2,y2 TO
,x2,y2
320 GCOL c
330 RECTANGLE x1,y1,y1,x2-x1,y2-y1
340 ENDP
```

Listing 10

```
10 REM >LocalTest (Info7a)
20 REM by Dave Acton
30 REM for Archimedes only
40 REM (c) BAU Sep 91
50 :
60 DIM mem% &100
70 ?mem%=42
80 mem%11=&12345
90 $ (mem%+5)="Outside the procedure..
"
100 PRINT $(mem%+5)
110 PRINT "?mem%=";?mem%
120 PRINT "mem%11=";mem%11
130 PROCedure(123,&ABCDE,"Inside the p
rocedure")
140 PRINT $(mem%+5)
150 PRINT "?mem%=";?mem%
160 PRINT "mem%11=";mem%11
170 END
180 :
190 DEF PROCedure(?mem%,mem%11,$ (mem%+
5))
200 PRINT $(mem%+5)
210 PRINT "?mem%=";?mem%
220 PRINT "mem%11=";mem%11
230 ENDP
```

Listing 11

```
10 MODE1:VDU23;8202;0;0;0;DIMY(63):F
ORY=0TO63:y(y)=*16:NEXT:FORx=0TO319:c=0
:FORy=1TO62:GCOL0,c+1:PLOT69,x*4,y(y):c
=(c+1)MOD3:NEXT:FORx=1TO62:REPEAT:z=y(y)+
16-RND(32):UNTILz=y(y-1)ANDz<y(y+1):y(y)
=z:NEXT:NEXT
```

Listing 12

```
10 MODE1:VDU23;8202;0;0;0;DIMsin(129
):c=0:h%=0:FORf%=0TO129:sin(f%)=50*SIN(c
):c=c+0.3:NEXT:CLS:FORx%=-50TO1320STEP20
:MOVEx%,1024:c%=0:GCOL0,h%+1:h%=(h%+1)M
OD3:FORy%=1024TO0STEP-8:DRANx%+sin(c%),y%
:c%=c%+1:NEXT:NEXT:IFGET
```

Listing 13

```
10 MODE12:OFF:DIMx(8),y(8):r=35:s=1:t
=2:REPEATMOUSEx(1),y(1),b:WAIT:SYS6,113,
s:SYS6,112,t:SWAPs,t:CLS:CIRCLEx(1),y(1)
,r:FORi=2TO8:GCOL1-1:x=x(i-1)-x(i):y=y(i
-1)-y(i):d=SQR(x*x+y*y)+.1:ps=(d-r)/d:x
(i)+=x*p:y(i)+=y*p:CIRCLEFLILx(i),y(i),r
:LINEX(i-1),y(i-1),x(i),y(i):NEXT:i=fb=4r
=-1:UNTIL0ELSEIFb=1r=1:UNTIL0ELSEUNTIL0
```



```

390 NEXT i%
400 NEXT y%
410 NEXT x%
420 :
430 FOR i%=1 TO 9
440 SYS spriteop,34+256,spritearea,"ba
11"+STR$(i%),i%*80,i%*80,8
450 NEXT i%
460 :
470 PRINT "Saving JugSprites"
480 SYS spriteop,12+256,spritearea,"Ju
gSprites"
490 END

```

Listing 2

```

10 REM Juggling (Juggle2)
20 REM by Nick Craig-Wood
30 REM for Arc Only
40 REM (c) BAU Sep91
50 :
60 REM starting hand is right hand =
0
70 :
80 MODE 15:MODE 13:OFF
90 screenx%=1024:screeny%=1280
100 PROCresetbanks
110 ON ERROR PROCerror
120 :
130 bally%=screenx%/40
140 bally%=bally%
150 rhand%=bally%*4
160 lx%=0.25*screenx%
170 rx%=0.75*screenx%
180 lx0%=lx%+rhand%
190 lx1%=lx%-rhand%
200 rx0%=rx%+rhand%
210 rx1%=rx%-rhand%
220 :
230 midx%=0.5*screenx%
240 chesty%=0.7*screeny%
250 shoulderx%=0.15*screenx%
260 shouldery%=0.65*screeny%
270 elbowx%=0.25*screenx%
280 elbowy%=0.37*screeny%
290 headx%=0.12*screeny%
300 heady%=screeny%-headx%
310 bottoy%=0
320 heighty%=0.8*screeny%
330 basey%=rhand%+bally%
340 :
350 rtick%=32
360 tickspeed%=2
370 nmax%=250
380 DIM pattern%(nmax%) :REM pattern
390 DIM height%(9) :REM height
of throw
400 DIM ticks%(9) :REM current
position of throw
410 DIM hands%(9) :REM startin
g hand
420 DIM pos%(9) :REM positio
n in pattern ball was thrown
430 :
440 DIM trackx%(9,rtick%*9)
450 DIM tracky%(9,rtick%*9)
460 DIM handx%(1,2*rtick%)
470 DIM handy%(1,2*rtick%)
480 r2%=2*rtick%
490 :
500 SpriteAreaSize=8*1024
510 DIM SpriteArea SpriteAreaSize
520 DIM sprite%(9)
530 SpriteArea!0=SpriteAreaSize
540 SpriteArea!8=16
550 SpriteOp=428
560 SYS SpriteOp,9+256,SpriteArea
570 SYS SpriteOp,10+256,SpriteArea,"Ju
gSprites"
580 FOR i%=1 TO 9
590 SYS SpriteOp,24+256,SpriteArea,"ba
11"+STR$(i%) TO ,,sprite%(i%-1)
600 NEXT i%
610 :
620 REM possible attributes
630 :
640 REPEAT
650 PROCgetpattern
660 PRINT "Computing throws ... ";
670 PROCtrack
680 PROCjuggle
690 UNTIL FALSE
700 END
710 :
720 DEF PROCgetpattern
730 PRINT TAB(0,1);
740 PRINT "Whilst the program is juggl
ing"
750 PRINT " + speeds it up"
760 PRINT " - slows it down"
770 PRINT "and SPACE enters another pa
tern"
780 PRINT
790 prompt$="Enter Pattern (Q to Quit
E for Examples)"
800 PRINT prompt$
810 ON
820 REPEAT
830 INPUT p$
840 ok=TRUE
850 IF LEN(p$) > nmax% THEN PRINT "Pattern
too big": ok=FALSE: p$="3"
860 plen%=0

```

```

870 FOR i%=1 TO LEN(p$
880 a$=MID$(p$,i%,1)
890 CASE a$ OF
900 WHEN "0","1","2","3","4","5","6","
7","8","9":
910 pattern%(plen%)=ASC(a$)-ASC("0")
920 plen%+=1
930 WHEN "Q","q"
940 END
950 WHEN "E","e"
960 PROCshowexamples
970 PRINT prompt$
980 ok=FALSE
990 OTHERWISE
1000 PRINT "Unrecognised command: ";a$
1010 ok=FALSE
1020 ENDCASE
1030 ENDCASE
1040 NEXT i%
1050 :
1060 IF plen%=0 THEN
1070 pattern%(0)=3
1080 plen%=1
1090 ENDIF
1100 :
1110 IF (plen% AND 1) THEN
1120 IF 2*plen% > nmax% THEN
1130 PRINT "Pattern too big"
1140 ok=FALSE
1150 ELSE
1160 FOR i%=0 TO plen%-1
1170 pattern%(plen%-i%)=pattern%(i%)
1180 NEXT i%
1190 plen%=2*plen%
1200 ENDF
1210 ENDF
1220 :
1230 func=0
1240 WHILE func<-1 AND ok
1250 func+=1
1260 CASE func OF
1270 WHEN 1: ok=FNgetsum
1280 WHEN 2: ok=FNgetav
1290 WHEN 3: ok=FNvalidpat
1300 OTHERWISE: func=-1
1310 ENDCASE
1320 ENDWHILE
1330 UNTIL ok
1340 IF max%>1 THEN
1350 yscale=heighty%/0.25/((max%-1)*(ma
x%-1))
1360 ELSE
1370 yscale=heighty%
1380 ENDF
1390 OFF
1400 ENDFPROC
1410 :
1420 DEF PROCshowexamples
1430 CLS
1440 PRINT "Example patterns"
1450 PRINT
1460 PRINT "0 - 9 cascade 0 - 9 balls"
1470 PRINT "31,51,71,91 shower 2,3,4,5
balls"
1480 PRINT
1490 PRINT "How to learn to juggle 3 ba
lls"
1500 PRINT "300, 3302, 2330, 330, 333"
1510 PRINT
1520 PRINT "How to learn to juggle 4 ba
lls"
1530 PRINT "423, 40, 04, 4440, 441, 4"
1540 PRINT
1550 PRINT "How to learn to juggle 5 ba
lls"
1560 PRINT "51, 15, 55500, 50505, 552,
55550, 5"
1570 PRINT
1580 PRINT "Some other interesting patt
erns"
1590 PRINT "423, 55500, 51, 531, 504, 6
12"
1600 PRINT "71, 53444, 53, 633, 552, 55
550, 5551"
1610 PRINT "33333333345151515141"
1620 PRINT
1630 PRINT "Fun, but impossible"
1640 PRINT "123456789, 97531, 678, 747"
1650 PRINT
1660 ENDFPROC
1670 :
1680 DEF FNgetsum
1690 ok=TRUE
1700 sum=0: max%=-1
1710 FOR i%=0 TO plen%-1
1720 a%=pattern%(i%)
1730 sum+=a%
1740 IF a%>max% THEN max%=a%
1750 NEXT i%
1760 ok
1770 :
1780 DEF FNgetav
1790 ok=TRUE
1800 nb=sum/plen%
1810 IF nb-INT(nb)<>0 THEN
1820 PRINT "Pattern was for ;nb; ball
s!"
1830 ok=FALSE
1840 ENDF
1850 nball%=INT(nb)
1860 ok
1870 :
1880 DEF FNvalidpat
1890 ok=TRUE

```

```

1900 IF plen%>1 THEN
1910 FOR i%=0 TO plen%-2
1920 FOR j%=i%+1 TO plen%-1
1930 IF pattern%(i%)+i%=pattern%(j%)+j%
THEN ok=FALSE
1940 NEXT j%
1950 NEXT i%
1960 ENDF
1970 IF NOT ok THEN
1980 PRINT "Pattern involved catching m
ore than one ball at a time"
1990 ENDF
2000 ok
2010 :
2020 DEF PROCjuggle
2030 height%()=-1
2040 ticks%()=0
2050 p%=-1
2060 hand%=0
2070 :
2080 REPEAT
2090 dticks%/rtick%
2100 REPEAT
2110 PROCTickjuggle
2120 hand%=1-hand%
2130 a$=INKEY$(0)
2140 UNTIL a$<" "
2150 :
2160 mego=FALSE
2170 REPEAT
2180 CASE a$ OF
2190 WHEN "+":
2200 tickspeed%=2*tickspeed%
2210 IF tickspeed%>rtick% THEN tickspee
d%=rtick%
2220 WHEN "-":
2230 tickspeed%=tickspeed%/2
2240 IF tickspeed%<1 THEN tickspeed%=1
2250 WHEN " ": mego=TRUE
2260 WHEN "Q","q": END
2270 ENDCASE
2280 a$=INKEY$(0)
2290 UNTIL a$=" " OR mego
2300 UNTIL mego
2310 ENDFPROC
2320 :
2330 DEF PROCTickjuggle
2340 p%=(p%+1) MOD plen%
2350 h%=pattern%(p%)
2360 ticks%()=ticks%()+rtick%
2370 IF h%>0 THEN
2380 REM find out which ball has landed
, and throw a new one if nec.
2390 b%=-1: c%=-1
2400 FOR i%=0 TO nball%-1
2410 IF ticks%(i%)>rticks%*height%(i%)
THEN
2420 IF height%(i%)>0 THEN b%=i% ELSE
c%=i%
2430 ENDF
2440 NEXT i%
2450 IF b%=-1 THEN b%=c%
2460 IF b%<-1 THEN
2470 height%(b%)=h%
2480 ticks%(b%)=0
2490 pos%(b%)=p%
2500 hands%(b%)=hand%
2510 ENDF
2520 ENDF
2530 :
2540 FOR ptick%=0 TO rtick%-1 STEP tick
speed%
2550 PROCstartupdate
2560 CLS
2570 PRINT p$
2580 :
2590 GCOL 63 TINT 255
2600 d%=rhand%/2
2610 t%=ptick%-rtick%*hand%
2620 LINE midx%-elbowx%,elbowy%, handx%
(1,t%),handy%(1,t%)-d%/2
2630 LINE midx%-elbowx%,elbowy%, handx%
(0,t%),handy%(0,t%)-d%/2
2640 LINE midx%-elbowx%,elbowy%, midx%-
shoulderx%,shouldery%
2650 LINE midx%-elbowx%,elbowy%, midx%-
shoulderx%,shouldery%
2660 LINE midx%-shoulderx%,shouldery%,
midx%,chesty%
2670 LINE midx%-shoulderx%,shouldery%,
midx%,chesty%
2680 LINE midx%,heady%-headx%, midx%,bo
ttoy%
2690 CIRCLE midx%,heady%,headx%
2700 :
2710 FOR i%=0 TO nball%-1
2720 IF height%(i%)>0 THEN
2730 t%=ticks%(i%)+ptick%
2740 h%=height%(i%)
2750 x%=trackx%(h%,t%)
2760 y%=tracky%(h%,t%)
2770 IF hands%(i%) THEN x%=screenx%-x%
2780 SYS SpriteOp,34+512,SpriteArea,spr
ite%(i%),x%-32,y%-16,8
2790 ENDF
2800 NEXT i%
2810 :
2820 PROCendupdate
2830 NEXT ptick%
2840 ENDFPROC
2850 :
2860 REM This makes the tracks for the
hands and the balls
2870 :

```

```

2880 DEF PROCtrack
2890 REM first track the hands
2900 FOR ptick%=0 TO r2%-1
2910 t=PI*ptick%/rtick%
2920 handx%(0,ptick%)=rx%-rhand%*SIN(t)
2930 handy%(0,ptick%)=basey%-rhand%*COS
(t)
2940 handx%(1,ptick%)=lx%-rhand%*SIN(t)
2950 handy%(1,ptick%)=basey%+rhand%*COS
(t)
2960 NEXT ptick%
2970 :
2980 REM now make each ball track
2990 :
3000 FOR p%=1 TO 9
3010 IF INSTR(p$,STR$(p%)) THEN
3020 PRINT ;p%;
3030 sh%=0
3040 h%=p%
3050 IF (h% AND 1) THEN fh%=1-sh% ELSE
fh%=sh%
3060 :
3070 REM This makes the tracks for thro
w from sh% to fh%, height h%
3080 REM in position p%
3090 :
3100 IF h%>1 THEN
3110 k0%=rtick%/2
3120 k1%=(h%*rtick%-rtick%/2) MOD r2%
3130 ELSE
3140 k0%=0
3150 k1%=rtick%
3160 ENDF
3170 sx%=handx%(sh%,k0%): sy%=handy%(sh
%,k0%)
3180 fx%=handx%(fh%,k1%): fy%=handy%(fh
%,k1%)
3190 :
3200 CASE h% OF
3210 :
3220 WHEN 3,4,5,6,7,8,9:
3230 FOR ptick%=0 TO h%*rtick%-1
3240 t=ptick%/rtick%
3250 q=ptick% MOD r2%
3260 IF t<0.5 THEN
3270 x%=handx%(sh%,q%)
3280 y%=handy%(sh%,q%)
3290 ELSE
3300 IF t=h%-0.5 THEN
3310 x%=handx%(fh%,q%)
3320 y%=handy%(fh%,q%)
3330 ELSE
3340 t=(t-0.5)/(h%-1)
3350 y%=(fy%-sy%)*t+sy%+yscale*t*(1-t)*
(h%-1)*(h%-1)
3360 x%=(fx%-sx%)*t+sx%
3370 ENDF
3380 ENDF
3390 trackx%(p%,ptick%)=x%
3400 tracky%(p%,ptick%)=y%
3410 NEXT ptick%
3420 :
3430 WHEN 2:
3440 FOR ptick%=0 TO h%*rtick%-1
3450 trackx%(p%,ptick%)=handx%(sh%,ptic
k%)
3460 tracky%(p%,ptick%)=handy%(sh%,ptic
k%)
3470 NEXT ptick%
3480 :
3490 WHEN 1:
3500 FOR ptick%=0 TO rtick%-1
3510 t=ptick%/rtick%
3520 trackx%(p%,ptick%)=(fx%-sx%)*t+sx%
3530 tracky%(p%,ptick%)=(fy%-sy%)*t+sy%
+yscale*t*(1-t)
3540 NEXT ptick%
3550 :
3560 ENDCASE
3570 ENDF
3580 NEXT p%
3590 ENDFPROC
3600 :
3610 DEF PROCerror
3620 ON ERROR OFF
3630 PROCresetbanks
3640 PRINT "**** Error ****"
3650 REPORT: PRINT " at ";ERRL
3660 END
3670 :
3680 DEF PROCresetbanks
3690 SYS "OS_Byte",19 :REM wait
for Vsync
3700 SYS "OS_Byte",112,0 :REM reset
logical bank
3710 SYS "OS_Byte",113,0 :REM reset
physical bank
3720 bank%=1
3730 ENDFPROC
3740 :
3750 DEF PROCstartupdate
3760 bank%=3-bank%
3770 SYS "OS_Byte",112,bank% :REM chang
e logical bank
3780 ENDFPROC
3790 :
3800 DEF PROCendupdate
3810 SYS "OS_Byte",19 :REM wait
for Vsync
3820 SYS "OS_Byte",113,bank% :REM chang
e physical bank
3830 ENDFPROC

```




Listing 3

```
10 REM JugAsm (Juggle3)
20 REM by Nick Craig-Wood
30 REM for B/B+/M/C
40 REM (c) BAU Sep91
50 :
60 MODE4
70 Sy%=255
80 Sx%=255
90 midx%=4*0.5*Sx%+128
100 elbowx%=4*0.25*Sx%
110 elbowy%=4*0.37*Sy%
120 r%=16 :REM number of sub ticks/tic
x
130 r2%=2*r%
140 ht%=0 :REM height of throw
150 st%=1 :REM starting hand of throw
160 ts%=2 :REM current position of thr
ow
170 ps%=3 :REM position in pt ball was
thrown
180 ox%=4: oy%=5 :REM old position of
ball
190 tl%=6: th%=7: REM place to find tr
jectory in memory
200 sx%=320: sy%=256: by%=40*8
210 PROCasm
220 RESTORE
230 FOR i%=0 TO 31 STEP 4
240 READ stab:i%
250 NEXT i%
260 DATA &F81FE007,&FE7FFC3F,&FFFFFE7F
,&FFFFFFF
270 DATA &FE7FFFFFFF,&FC3FFE7F,&E007F81F
,&00000000
280 :
290 FOR j%=1 TO 9
300 CLS: VDU 5: MOVE 112,1008: PRINT ;
j%: VDU 4
310 A%=0: X%=0: Y%=0: CALL sprite
320 FOR i%=0 TO 31
330 ?(stab+i%*32*j%)=? (scr%+8*(i% MOD
2)+((i% DIV 2)AND7)+24+by%*(i%DIV16))
340 NEXT i%
350 NEXT j%
360 a$="JugCode "+STR$ "start%+" "+STR$
"endcode
370 PRINT "Saving code as ";a$
380 OSCLI("save "+a$)
390 CHAIN "Juggle"
400 END
410 :
420 DEF FNr: X%=X%+1: =X%-1
430 :
440 DEF PROCasm
450 PRINT "Assembling ..."
460 scr%=&5800: code=&5400: ltab=code-
8: stab=&5200: ytab=&5000
470 balls=&4F00: pt%=&4E00: start%=&4E
00
480 hands=pt%-4*r2%: tr%=hands-2*45*r%
490 FOR y%=0 TO 255
500 a%=scr%+(y% DIV 8)*by%+(y% AND 7)+
3*8
510 ytab?y%=a% MOD 256
520 ?(ytab+256+y%)=a% DIV 256
530 NEXT y%
540 :
550 p=&70: hand=&71: nball=&72: n=&73:
s=&74: c=&75
560 OSBYTE=&FFF4: OSWRCH=&FFEE: X%=&76
570 ayl=FNR: ayh=FNR: apl=FNR: aph=FNR
: count=FNR: shifts=FNR
580 ail=FNR: aih=FNR: s0=FNR: s1=FNR:
s2=FNR: s3=FNR: b=FNR
590 pball1=FNR: pballh=FNR: i=FNR: px=
FNR: py=FNR: ptick=FNR
600 ptrack1=FNR: ptrackh=FNR: h=FNR
610 FOR pass=0 TO 2 STEP 2
620 P%=code
630 [opt pass
640 jmp tickjuggle
650 .wait
660 lda s
670 AND #&80
680 BNE nowait
690 LDA #19
700 JSR OSBYTE
710 .nowait
720 RTS
730 \This plots the sprite in A at X,Y
740 .sprite
750 ASL A
760 ASL A
770 ASL A
780 ASL A
790 ASL A
800 STA ail
810 LDA #stab DIV 256
820 ADC #0
830 STA aih
840 STY ayl
850 LDA #ytab DIV 256
860 STA ayh
870 LDY #0
880 LDA (ayl),Y
890 STA apl
900 INC ayh
910 LDA (ayl),Y
920 STA aph
930 TXA
940 AND #&F8
950 CLC
960 ADC apl
970 STA apl
980 LDA #0
990 ADC aph
1000 STA aph
1010 TXA
1020 AND #&7
1030 STA shifts
1040 LDA #16
1050 STA count
1060 :
1070 .sprloop
1080 LDY #0
1090 LDA (ail),Y
1100 STA s0
1110 INC ail
1120 LDA (ail),Y
1130 STA s1
1140 INC ail
1150 TXA
1160 LDY shifts
1170 CPY #0
1180 BEQ sprnoshift
1190 .sprshift
1200 LSR s0
1210 NOR s1
1220 ROR A
1230 DEX
1240 BNE sprshift
1250 .sprnoshift
1260 STA s2
1270 LDA (apl),Y
1280 ROR s0
1290 STA (apl),Y
1300 LDY #8
1310 LDA (apl),Y
1320 ROR s1
1330 STA (apl),Y
1340 LDY #16
1350 LDA (apl),Y
1360 ROR s2
1370 STA (apl),Y
1380 :
1390 INC apl
1400 BNE spr1
1410 INC aph
1420 .spr1
1430 INC ayl
1440 LDA ayl
1450 AND #&7
1460 BNE spr2
1470 CLC
1480 LDA apl
1490 ADC #(by%-8) MOD 256
1500 STA apl
1510 LDA aph
1520 ADC #(by%-8) DIV 256
1530 STA aph
1540 .spr2
1550 DEC count
1560 BNE sprloop
1570 RTS
1580 :
1590 .plotballs
1600 LDA #0
1610 STA i
1620 STA pball1
1630 LDA #balls DIV 256
1640 STA pballh
1650 .pthloop
1660 LDY #ht%
1670 LDA (pball1),Y
1680 CMP #255
1690 BNE ptb9
1700 JMP notplotball
1710 .ptb9
1720 LDY #ta%
1730 LDA #0
1740 STA ptrackh
1750 LDA (pball1),Y
1760 ASL A
1770 ROL ptrackh
1780 ASL A
1790 ROL ptrackh
1800 ASL A
1810 ROL ptrackh
1820 ASL A
1830 ROL ptrackh \*r% (*16)
1840 CLC
1850 ADC ptick
1860 STA ptrack1
1870 LDA #0
1880 ADC ptrackh
1890 STA ptrackh
1900 ASL ptrack1
1910 ROL ptrackh
1920 LDY #ht%
1930 LDA (pball1),Y
1940 ASL A
1950 ASL A
1960 ASL A
1970 STA s0
1980 LDA #balls DIV 256
1990 STA s1
2000 LDY #tl%
2010 LDA (s0),Y
2020 STA s2
2030 INY
2040 LDA (s0),Y
2050 STA s3
2060 CLC
2070 LDA ptrack1
2080 ADC s2
2090 STA ptrack1
2100 LDA ptrackh
2110 ADC s3
2120 STA ptrackh
2130 LDY #0
2140 LDA (ptrack1),Y
2150 STA px
2160 INY
2170 LDA (ptrack1),Y
2180 STA py
2190 LDY #st%
2200 LDA (pball1),Y
2210 CMP #0
2220 BEQ ptb1
2230 LDA px
2240 ROR #255
2250 STA px
2260 .ptb1
2270 LDA py
2280 ROR #255
2290 STA py
2300 JSR wait
2310 LDY #ox%
2320 LDA (pball1),Y
2330 TAX
2340 LDY #oy%
2350 LDA (pball1),Y
2360 TAY
2370 LDA i
2380 CLC
2390 ADC #1
2400 CPY #255
2410 BEQ ptb3
2420 JSR sprite
2430 .ptb3
2440 LDA i
2450 CLC
2460 ADC #1
2470 LDY px
2480 LDY py
2490 JSR sprite
2500 LDY #ox%
2510 LDA px
2520 STA (pball1),Y
2530 LDY #oy%
2540 LDA py
2550 STA (pball1),Y
2560 .notplotball
2570 LDA #8
2580 CLC
2590 ADC pball1
2600 STA pball1
2610 INC i
2620 LDA i
2630 CMP nball
2640 BEQ ptb8
2650 JMP ptbloop
2660 .ptb8
2670 RTS
2680 :
2690 .tickjuggle
2700 INC p
2710 LDA p
2720 CMP n
2730 BCC tkj0
2740 LDA #0
2750 STA p
2760 .tkj0
2770 TAY
2780 LDA pt%,Y
2790 STA h
2800 LDA #255
2810 STA b
2820 STA c
2830 LDA #0
2840 STA i
2850 STA pball1
2860 LDA #balls DIV 256
2870 STA pballh
2880 .tkjloop
2890 LDY #ht%
2900 LDA (pball1),Y
2910 STA s0
2920 LDY #ta%
2930 LDA (pball1),Y
2940 CLC
2950 ADC #1
2960 STA (pball1),Y
2970 STA s1
2980 LDA s0
2990 CMP #255
3000 BNE tkjtest
3010 LDA i
3020 STA c
3030 JMP tkjnotest
3040 .tkjtest
3050 LDA s1
3060 CMP s0
3070 BCC tkjnotest
3080 LDA i
3090 STA b
3100 .tkjnotest
3110 LDA #8
3120 CLC
3130 ADC pball1
3140 STA pball1
3150 INC i
3160 LDA i
3170 CMP nball
3180 BNE tkjloop
3190 LDA h
3200 CMP #0
3210 BEQ tkjnotest
3220 LDA b
3230 CMP #255
3240 BNE tkj1
3250 LDA c
3260 CMP #255
3270 BEQ tkjnotest
3280 .tkj1
3290 ASL A
3300 ASL A
3310 ASL A
3320 STA pball1
3330 LDA #balls DIV 256
3340 STA pballh
3350 LDY #ht%
3360 LDA h
3370 STA (pball1),Y
3380 LDY #ta%
3390 LDA #0
3400 STA p
3410 LDA p
3420 ROR #255
3430 STA p
3440 LDA p
3450 LDY #st%
3460 STA (pball1),Y
3470 .tkjnotest
3480 LDA #0
3490 STA ptick
3500 .tkjloop
3510 JSR plotlines
3520 JSR plotballs
3530 LDA s
3540 AND #&7F
3550 CLC
3560 ADC ptick
3570 STA ptick
3580 CMP #r%
3590 BCC tkjloop
3600 LDA hand
3610 ROR #1
3620 STA hand
3630 LDA #129
3640 LDY #0
3650 LDY #0
3660 JSR OSBYTE
3670 STX c
3680 CPY #&FF
3690 BNE tkj9
3700 JMP tickjuggle
3710 .tkj9
3720 RTS
3730 :
3740 .calchand
3750 LDY b
3760 LDA hands,Y
3770 STA s0
3780 INY
3790 LDA hands,Y
3800 STA s2
3810 INY
3820 STY b
3830 LDA #0
3840 ASL s0
3850 ROL A
3860 ASL s0
3870 ROL A
3880 STA s1
3890 LDA s0
3900 CLC
3910 ADC #128
3920 STA s0
3930 LDA s1
3940 ADC #0
3950 STA s1
3960 LDA #0
3970 ASL s2
3980 ROL A
3990 CLC
4000 ADC #128
4010 STA s0
4020 LDA s2
4030 SEC
4040 SBC #40
4050 STA s2
4060 LDA s3
4070 SBC #0
4080 STA s3
4090 RTS
4100 :
4110 .plotlines
4120 LDA ptick
4130 ASL A
4140 ASL A
4150 STA b
4160 LDA hand
4170 CMP #0
4180 BEQ ptl1
4190 LDA b
4200 CLC
4210 ADC #2*r2%
4220 STA b
4230 .ptl1
4240 LDA ltab+0
4250 STA s0
4260 LDA ltab+1
4270 STA s1
4280 LDA ltab+2
4290 STA s2
4300 LDA ltab+3
4310 STA s3
4320 JSR wait
4330 JSR leftarm
4340 JSR calchand
4350 JSR leftarm
4360 LDA s0
```



```

4370 STA ltab+0
4380 LDA s1
4390 STA ltab+1
4400 LDA s2
4410 STA ltab+2
4420 LDA s3
4430 STA ltab+3
4440 LDA ltab+4
4450 STA s0
4460 LDA ltab+5
4470 STA s1
4480 LDA ltab+6
4490 STA s2
4500 LDA ltab+7
4510 STA s3
4520 JSR wait
4530 JSR rightarm
4540 JSR calchand
4550 JSR rightarm
4560 LDA s0
4570 STA ltab+4
4580 LDA s1
4590 STA ltab+5
4600 LDA s2
4610 STA ltab+6
4620 LDA s3
4630 STA ltab+7
4640 RTS
4650 :
4660 .leftarm
4670 LDA s0
4680 CMP #&FF
4690 BEQ leftarmend
4700 OPT FNLline(midx%-elbowx%,elbowy%)
4710 .leftarmend
4720 RTS
4730 :
4740 .rightarm
4750 LDA s0
4760 CMP #&FF
4770 BEQ rightarmend
4780 OPT FNLline(midx%+elbowx%,elbowy%)
4790 .rightarmend
4800 RTS
4810 :
4820 .endcode
4830 ]
4840 NEXT pass
4850 ENDPROC
4860 :
4870 DEF FNLline(x%,y%)
4880 [OPT pass
4890 LDA #25
4900 JSR OSWRCH
4910 LDA #4
4920 JSR OSWRCH
4930 LDA #(x% MOD 256)
4940 JSR OSWRCH
4950 LDA #(x% DIV 256)
4960 JSR OSWRCH
4970 LDA #(y% MOD 256)
4980 JSR OSWRCH
4990 LDA #(y% DIV 256)
5000 JSR OSWRCH
5010 LDA #25
5020 JSR OSWRCH
5030 LDA #5
5040 JSR OSWRCH
5050 LDA s0
5060 JSR OSWRCH
5070 LDA s1
5080 JSR OSWRCH
5090 LDA s2
5100 JSR OSWRCH
5110 LDA s3
5120 JSR OSWRCH
5130 ]
5140 =pass

```

Listing 4

```

10 REM Juggle (Juggle4)
20 REM by Nick Craig-Wood
30 REM for B/B/M/C
40 REM (c) BAU Sep 91
50 :
60 MODE4
70 VDU 23;8202;0;0;0;0
80 Sy%:=255: Sx%:=255
90 rh%:=Sy%/12
100 lx%:=0.25*Sx%: rx%:=0.75*Sx%

```

Listing 1

```

10 REM WideSrc (Widel)
20 REM by John Robinson
30 REM for B only
40 REM (c) BAU Sep 91
50 :
60 PROCInitialise
70 PROCAssemble
80 PROCsave
90 END
100 :
110 DEF PROCInitialise
120 DIM code &200
130 characters:=102 :REM Change th
is if necessary

```

```

950 CLS
960 PRINT "Example patterns"
970 PRINT
980 PRINT "0 - 9 cascade 0 - 9 balls"
990 PRINT "31,51,71,91 shower 2,3,4,5
balls"
1000 PRINT
1010 PRINT "How to learn to juggle 3 ba
lls"
1020 PRINT "300, 3302, 2330, 330, 333"
1030 PRINT
1040 PRINT "How to learn to juggle 4 ba
lls"
1050 PRINT "423, 40, 04, 4440, 441, 4"
1060 PRINT
1070 PRINT "How to learn to juggle 5 ba
lls"
1080 PRINT "51, 15, 55500, 50505, 552,
55550, 5"
1090 PRINT
1100 PRINT "Some other interesting patt
erns"
1110 PRINT "423, 55500, 51, 531, 504, 6
12"
1120 PRINT "71, 53444, 53, 633, 552, 55
550, 5551"
1130 PRINT "3333333334515151515141"
1140 PRINT
1150 PRINT "Interesting, but impossible
!"
1160 PRINT "123456789, 97531, 747, 678"
1170 PRINT
1180 ENDPROC
1190 :
1200 DEF FNgetsum
1210 ok:=TRUE
1220 sum%=0: max%=-1
1230 FOR i%=0 TO n%-1
1240 a%=ptick%i
1250 sum%=sum%+a%
1260 IF a%>max% THEN max%=a%
1270 NEXT i%
1280 =ok
1290 :
1300 DEF FNgetav
1310 ok:=TRUE
1320 nb:=sum%/n%
1330 IF nb-INT(nb)<0 THEN PRINT "patte
rn was for ";nb; " balls!": ok:=FALSE
1340 nball%=INT(nb)
1350 =ok
1360 DEF FNvalidpat
1370 ok:=TRUE
1380 FOR i%=0 TO n%-2
1390 FOR j%=i%+1 TO n%-1
1400 IF pt%i+i%+i%+i%+i% THEN ok:=FAL
SE
1410 NEXT j%
1420 NEXT i%
1430 IF NOT ok THEN PRINT "Pattern invo
lved catching more than one ball at a ti
me"
1440 =ok
1450 :
1460 DEF PROCjuggle
1470 CLS: PRINT p$: VDU 23,1,0;0;0;0;
1480 GCOL 0,1
1490 MOVE midx%,chesty%
1500 PLOT 5,midx%-shoulderx%,shouldery%
1510 PLOT 5,midx%-elbowx%,elbowy%
1520 MOVE midx%,chesty%
1530 PLOT 5,midx%+shoulderx%,shouldery%
1540 PLOT 5,midx%+elbowx%,elbowy%
1550 MOVE midx%,heady%-headd%: PLOT 5,m
idx%,bottomy%
1560 MOVE midx%+headd%,heady%
1570 FOR t=0 TO 2.05*PI STEP PI/10
1580 PLOT 5,midx%+headd%*COS(t),heady%+
headd%*SIN(t)
1590 NEXT t
1600 GCOL 3,1
1610 PLOT 69,midx%-elbowx%,elbowy%: PLO
T 69,midx%+elbowx%,elbowy%
1620 FOR i%=0 TO 9
1630 a%=balls+8*i%
1640 a%?ht%=255
1650 a%?tn%=0
1660 a%?ox%=255
1670 NEXT i%
1680 ?pnball%-1: ?hand%= ?nball-nball
%: ?n%=n%
1690 !ltab=-1: ltab!4=-1

```

```

1700 REPEAT
1710 REPEAT
1720 ?s=s%+128*xs%: CALL code
1730 a$=CHR$(?c)
1740 UNTIL a$<" "
1750 mego=FALSE
1760 REPEAT
1770 IF a$="+" OR a$="F" OR a$="f" THEN
s%:=2*s%: IF s%>r% s%=r%
1780 IF a$="-" OR a$="S" OR a$="s" THEN
s%:=s%/2: IF s%<1 s%=1
1790 IF a$="X" OR a$="x" THEN xs%=1-xs%
1800 IF a$=" " THEN mego=TRUE
1810 IF a$="Q" OR a$="q" THEN END
1820 a$=INKEY$(0)
1830 UNTIL a$="" OR mego
1840 UNTIL mego
1850 ENDPROC
1860 :
1870 DEF PROCtrack
1880 REM first track the hands
1890 FOR ptick%=0 TO r2%-1
1900 t=PI*ptick%/r%
1910 a%:=hands+4*ptick%
1920 a%?0=lx%+rh%*SIN(t)
1930 a%?1=basy%+rh%*COS(t)
1940 a%?2=rx%+rh%*SIN(t)
1950 a%?3=basy%+rh%*COS(t)
1960 NEXT ptick%
1970 REM now make each ball track
1980 sh%=0
1990 FOR h%=1 TO max%
2000 IF INSTR(p$,STR$h%)=0 THEN GOTO 23
90
2010 PRINT ;h%;
2020 IF (h% AND 1) THEN fh%=2-sh% ELSE
fh%=sh%
2030 k0%=r%/2: k1%:=h%-r%-r%/2
2040 IF h%=1 THEN k0%=0: k1%=r%
2050 a%:=hands+sh%+4*(k0% MOD r2%): sx%
=a%?0: sy%:=a%?1
2060 a%:=hands+fh%+4*(k1% MOD r2%): fx%
=a%?0: fy%:=a%?1
2070 IF h%<2 THEN GOTO 2270
2080 FOR ptick%=0 TO h%*r%-1
2090 ti=ptick%/r%
2100 IF ti>=0.5 THEN GOTO 2150
2110 a%:=hands+sh%+4*(ptick% MOD r2%)
2120 x%=a%?0
2130 y%=a%?1
2140 GOTO 2230
2150 IF ti<0.5 THEN GOTO 2200
2160 a%:=hands+fh%+4*(ptick% MOD r2%)
2170 x%=a%?0
2180 y%=a%?1
2190 GOTO 2230
2200 t=(ti-0.5)/(h%-1)
2210 y%=(fy%-sy%)*t+sy%:yscale=t*(1-t)*
(h%-1)*(h%-1)
2220 x%=(fx%-sx%)*t+sx%
2230 ?(tp%(h%)+2*ptick%)=x%
2240 ?(tp%(h%)+2*ptick%+1)=y%
2250 NEXT ptick%
2260 GOTO 2390
2270 IF h%<1 THEN GOTO 2340
2280 FOR ptick%=0 TO h%*r%-1
2290 a%:=hands+sh%+4*(ptick% MOD r2%)
2300 ?(tp%(h%)+2*ptick%)=a%?0
2310 ?(tp%(h%)+2*ptick%+1)=a%?1
2320 NEXT ptick%
2330 GOTO 2390
2340 FOR ptick%=0 TO r%-1
2350 t=ptick%/r%
2360 ?(tp%(h%)+2*ptick%)=(fx%-sx%)*t+sx
%
2370 ?(tp%(h%)+2*ptick%+1)=(fy%-sy%)*t+
sy%+2*yscale*t*(1-t)
2380 NEXT ptick%
2390 NEXT h%
2400 ENDPROC
2410 :
2420 DEF PROCgetcode
2430 scr%:=5800: code:=5400: ltab=code-
8: stabs:=5200: ytab:=5000
2440 balls:=4400: pt%:=4400: start%:=44E
00
2450 hands=pt%-4*r2%: tr%:=hands-2*45*r%
2460 ps:=670: hand:=71: nball:=72: ns:=73:
s:=474: cs:=75
2470 *load jugcode
2480 ENDPROC

```

Wide VDU

```

4800 EQU0 0
4900 :
5000 .table 4_CRTC
5100 EQU0 1:EQU0 characters/2
5200 EQU0 2:EQU0 ((characters DIV 2)+57
) DIV 2
5300 EQU0 4:EQU0 34
5400 EQU0 6:EQU0 lines
5500 EQU0 7:EQU0 (lines DIV 2)+18
5600 EQU0 9:EQU0 8
5700 EQU0 0
5800 :
5900 .goldv EQU0 &4C
6000 .oldv EQU0 0
6100 .newmodeflag EQU0 0
6200 :
6300 .init_start

```




```
640 LDA #1
650 LDX #zp
660 LDY #0
670 JSR osargs
680 LDY zp+1
690 LDX zp
700 STY &F3      Pointer used by GSR
EAD
710 STX &F2
720 CLC
730 LDY #0
740 JSR gsinitt
750 BEQ no_bad_syntax
760 BRK
770 EQU8 254
780 EQU8 "Syntax: *Wide*+STR$character
a
790 EQU8 0
800 :
810 .no_bad_syntax
820 LDA #&90      Set *TV parameters
830 LDX #0
840 LDY #1
850 JSR osbyte
860 LDY wrchv+1    Save old vector con
tents
870 LDX wrchv
880 STY oldv+1
890 STX oldv
900 LDY #newwrch DIV 256
910 LDX #newwrch MOD 256
920 STY wrchv+1    Install new routine
930 STX wrchv
940 LDA #22        Go into mode 0
950 JSR oswrch     (that's the OF mode
0)
960 LDA #0
970 JSR oswrch
980 RTS

990 :
1000 .newwrch
1010 PHA
1020 TXA
1030 PHA
1040 TYA
1050 PHA
1060 TSX
1070 LDA &103,X
1080 LDX newmodeflag
1090 BEQ checknewmode
1100 JSR goldv
1110 LDX #0
1120 STX newmodeflag
1130 ORA #0
1140 BEQ do_XtraWide
1150 CMP #4
1160 BNE exit
1170 .do_XtraWide
1180 JSR setUpXtraWide
1190 :
1200 .exit
1210 PLA
1220 TAY
1230 PLA
1240 TAX
1250 PLA
1260 RTS
1270 :
1280 .checknewmode
1290 LDX &DA+&190    Equivalent to read
using OSBYTE &DA; length of VDU queue
1300 BNE execcxit
1310 CMP #22
1320 BNE execcxit
1330 STA newmodeflag
1340 :
1350 .execcxit
1360 JSR goldv

1370 JMP exit
1380 :
1390 .setUpXtraWide
1400 LDA curMode
1410 BNE mode4table
1420 TAX
1430 BEQ redefine_CRTC
1440 :
1450 .mode4table
1460 LDX #table_4_CRTC-tableCRTC
1470 :
1480 .redefine_CRTC
1490 LDA tableCRTC,X
1500 BEQ finished_CRTC
1510 STA CRTRegister
1520 INX
1530 LDA tableCRTC,X
1540 STA CRTdata
1550 INX
1560 BNE redefine_CRTC
1570 :
1580 .finished_CRTC
1590 LDY #characters*8 DIV 256
1600 LDX #characters*8 MOD 256
1610 LDA curMode
1620 BEQ noDiv2
1630 TYA      Mode 4; Lines are h
alf as long, so we
1640 LSR A      must divide new lin
e length by 2
1650 TAY
1660 TXA
1670 ROR A
1680 TAX
1690 :
1700 .noDiv2
1710 STY &353    Screen width in byt
es
1720 STX &352

1730 STY &34D      Text window width i
n bytes
1740 STX &34C
1750 LDA #0
1760 STA &361      Not a graphics mode
any more
1770 LDA #lines-1
1780 STA &309      Bottom row of text
window, in character rows
1790 LDA #characters-1
1800 LDX curMode
1810 BEQ nochangechars
1820 LDA #(characters DIV 2)-1
1830 :
1840 .nochangechars
1850 STA &30A      Rightmost column of
text window, in characters
1860 LDY #newtable DIV 256
1870 LDX #newtable MOD 256
1880 STY &E1      OS pointer to multi
plication tables
1890 STX &E0      This isn't on the M
aster so this program can't work
1900 RTS
1910 :
1920 ]
1930 NEXT pass
1940 ENDPROC
1950 :
1960 DEF PROCsave
1970 save$="SAVE Wide"+STR$characters+
" "+STR$code+" "+STR$O$+" "+STR$(init
_start OR &FFFF0000)+ " "+STR$(origin OR
&FFFF0000)
1980 PRINT save$; " ? (Y/N) ";
1990 IF (GET OR &20)=ASC "Y" THEN PRINT
"Yes":OSCLI save$:PRINT "OK" ELSE PRINT
"No"
2000 ENDPROC
```

Shopping

Listing 1

```
10 REM Trolley (Trolley1)
20 REM By Dave Lawrence
30 REM For BBC B/B+/M/C/A
40 REM (c) BAU September 1991
50 :
60 list$="BAUlist"
70 arc=(HIMEM>&10000)
80 IF NOT arc AND PAGE=&1300 THEN PAG
E=&1300:CHAIN "Trolley"
90 ON ERROR time$="":GOTO 110
100 time$=TIME$
110 ON ERROR OFF
120 :
130 MODE 7
140 PROCcursor(0)
150 PROCinit
160 PROCscreen
170 PROCdate
180 ON ERROR PROCError:GOTO 190
190 REPEAT
200 opt=FNmenu
210 IF opt=1 PROCload
220 IF opt=2 PROCedit
230 IF opt=3 PROCsave
240 IF opt=4 PROClist
250 UNTIL opt=5
260 *FX 4,0
270 *FX 225,1
280 *FX 229,1
290 MODE 7
300 END
310 :
320 DEF PROCerr(err$)
330 IF arc ERROR 1,err$
340 $&100=CHR$(0)+CHR$(1+err$)+CHR$(0):CALL
&100
350 ENDPROC
360 :
370 DEF PROCError
380 CLOSE #0
390 VDU 26,31,0,22,131,157,129,31,0,23
,131,157,129
400 VDU 28,3,23,39,22,7
410 REPORT
420 PRINT "      Press space to continu
e"
430 IFGET
440 VDU 28,0,23,39,22,12,26
450 ENDPROC
460 :
470 DEF PROCinit
480 Name=0
490 Total=24
500 Dates=28
510 Size=96
520 IF arc maxitems=500 ELSE maxitems=
130
530 maxslots=8 : REM up to 17
540 maxlens=23
550 normax=20
560 none=255
570 DIM Data maxitems*Size,count maxit
ems
580 DIM opt$(4),doy(11)
590 DIM date(maxslots-1),num(maxslots-
1)

600 FOR opt=0 TO 4
610 READ opt$(opt)
620 NEXT
630 doy=0
640 ms=""
650 FOR i=0 TO 11
660 READ ms,dim
670 mon$=mons$+m$
680 doy(i)=doy
690 doy=doy+dim
700 NEXT
710 items=0
720 dosave=FALSE
730 sorted=TRUE
740 PROCclear(items)
750 *FX 4,1
760 *FX 225,140
770 *FX 229,1
780 ENDPROC
790 :
800 DEF PROCcursor(c%)
810 VDU 23,10,255-c%*63,0,0,0;
820 ENDPROC
830 :
840 DATA Load new file,Edit list,Save
file,Produce list,Quit program
850 DATA Jan,31,Feb,28,Mar,31,Apr,30,M
ay,31,Jun,30
860 DATA Jul,31,Aug,31,Sep,30,Oct,31,N
ov,30,Dec,31
870 :
880 DEF PROCscreen
890 FOR i=0 TO 1
900 VDU 31,0,1,132,157
910 PRINTTAB(10)CHR$(134)CHR$(141)*Shoppin
g List"
920 NEXT
930 VDU 31,0,24,129,157,131
940 PROCshowname("")
950 ENDPROC
960 :
970 DEF PROCshowname(a$)
980 PRINTTAB(2,24);CHR$(131)CHR$(34);a$;C
HR$(34);STRING$(10-LENa$," ");
990 ENDPROC
1000 :
1010 DEF PROCcls
1020 VDU 28,0,23,39,2,12,26
1030 ENDPROC
1040 :
1050 DEF PROCdate
1060 IF time$="" OR time$="Fri,31 Dec 1
999.23:59:59" today$=FNgetdate ELSE toda
y$=MID$(time$,5,11)
1070 PRINTTAB(26,24);today$;
1080 today=FNfromtext(today$)
1090 ENDPROC
1100 :
1110 DEF FNgetdate
1120 in=OPENIN("Date")
1130 IF in=0 a$="01 Jan 1991" ELSE a$=F
Ngetline(in)
1140 CLOSE #in
1150 day=FNfromtext(a$)
1160 last=day
1170 old=-1

1180 PRINTTAB(7,10);"Please enter today
's date"
1190 REPEAT
1200 IF day<old PRINTTAB(10,12);CHR$(13
1);[" ";CHR$(130);FNtotext(day);CHR$(131); "
"];
1210 key$=GET$
1220 old=day
1230 IF INKEY=1 add%=7 ELSE add%=1
1240 IF key$=CHR$(136 day=day+add%:IF da
y<last day=last
1250 IF key$=CHR$(137 day=day+add%
1260 UNTIL key$=CHR$(13
1270 PROCcls
1280 d$=FNtotext(day)
1290 out=OPENOUT("Date")
1300 PROCstrput(out,d$,CHR$(10)
1310 CLOSE#out
1320 =d$
1330 :
1340 DEF FNmenu
1350 PROCcls
1360 FOR opt=0 TO 4
1370 PRINTTAB(11,5+opt*2);CHR$(130);"<";L
EFT$(opt$(opt),1);">";CHR$(131);opt$(opt)
1380 NEXT
1390 PRINTTAB(13,16);"Select Option:";
1400 PROCcursor(1)
1410 REPEAT
1420 k$=GET$
1430 IF k$=CHR$(27 k$="E"
1440 opt=INSTR(" LIESeSpPqk",k$)DIV2
1450 UNTIL opt<>0
1460 PROCcursor(0)
1470 =opt
1480 :
1490 DEF PROCload
1500 PROCcls
1510 new$=FNlist("load",list$)
1520 IF new$="" ENDPROC
1530 items=FNloadlist(new$)
1540 list$=new$
1550 PROCclear(items)
1560 sorted=TRUE
1570 ENDPROC
1580 :
1590 DEF FNlist(pr$,l$)
1600 PRINTTAB(11,5);"Enter file to ";pr
$;TAB(15,8);"-----";TAB(14,7);CHR$(1
30);l$;
1610 PROCcursor(1)
1620 REPEAT
1630 k$=GET$
1640 IF k$=CHR$(127 AND l$<>" " l$=LEFT$(
l$,LENl$-1):VDU 127
1650 IF ASCK$>32 AND ASCK$<127 AND LENl
$<10 PRINTk$;:l$=l$+k$
1660 IF ASCK$=21 PRINTSTRING$(LENl$,CHR
$(127));:l$=""
1670 UNTIL k$=CHR$(27 OR k$=CHR$(13
1680 IF k$=CHR$(27 l$=""
1690 PROCcursor(0)
1700 =l$
1710 :
1720 DEF FNloadlist(name$)
1730 in=OPENIN(name$)
1740 IF in=0 PROCerr("File not found")

1750 PROCshowname(name$)
1760 line=0
1770 item=0
1780 l$=FNmustbe("list:")
1790 l$=FNmustbe("last:")
1800 REPEAT
1810 REPEAT
1820 c$=BGET#in
1830 UNTIL c$>31
1840 PTR#in=PTR#in-1
1850 item$=FNmustbe("item:")
1860 total=VALFNmustbe("total:")
1870 PROCinform("Loading",item$)
1880 PROCclear(item)
1890 $[Data+item*Size]=item$
1900 ! [Data+item*Size>Total]=total
1910 IF total<>0 PROCloaddates
1920 item=item+1
1930 UNTIL EOF#in
1940 CLOSE #in
1950 dosave=FALSE
1960 =item
1970 :
1980 DEF FNmustbe(str$)
1990 LOCAL in$
2000 in$=FNgetline(in)
2010 IF LEFT$(in$,LENstr$)<>str$ PROCer
r("File format error")
2020 =FNskip(in$)
2030 :
2040 DEF PROCinform(a$,b$)
2050 PRINTTAB(0,23);CHR$(131)CHR$(157);CHR
$(129);a$;CHR$(32);CHR$(34);b$;CHR$(34);STRING$(
39-POS, " ")
2060 ENDPROC
2070 :
2080 DEF FNgetline(f)
2090 l$=""
2100 REPEAT
2110 c=BGET#f
2120 IF c>31 l$=l$+CHR$(c)
2130 UNTIL c<32
2140 line=line+1
2150 =l$
2160 :
2170 DEF FNskip(l$)
2180 l=INSTR(l$, " ") -1
2190 REPEAT
2200 l=l+1
2210 UNTIL MID$(l$,1,1)<>" "
2220 =MID$(l$,1,1)
2230 :
2240 DEF FNmonthnum(m$)
2250 LOCAL mm$
2260 mm%=INSTR(mons$,m$)-1
2270 IF mm%<0 PRINT"Unknown month : ";m
$;END
2280 =mm% DIV 3
2290 :
2300 DEF FNlow(u$)
2310 IF u$="" THEN =""
2320 LOCAL l$,i,c
2330 l$=""
2340 FOR i=1 TO LENu$
2350 c=ASC MID$(u$,i,1)
2360 IF c>=ASC "A" AND c<=ASC "Z" l$=l$+C
HR$(c+32) ELSE l$=l$+CHR$(c)
```



```

2370 NEXT
2380 =1$
2390 :
2400 DEF PROCloaddates
2410 date=0
2420 REPEAT
2430 a$=FNgetline(in)
2440 IF LEFT$(a$,5)="date:" PROCadddate
(FNskip(a$))
2450 UNTIL a$="" OR EOF#in
2460 ENDPROC
2470 :
2480 DEF PROCadddate(date$)
2490 date$=date$+" (1)"
2500 num=INSTR(date$,"(")
2510 num=VALMID$(date$,num+1)
2520 PROCsetdate(item,date,date$,num)
2530 date=date+1
2540 ENDPROC
2550 :
2560 DEF PROCclear(i%)
2570 IF i%>maxitems ENDPROC
2580 LOCAL i
2590 FOR i=0 TO Size-1 STEP 4
2600 i!(Data+i%*Size)=0
2610 NEXT
2620 ?(Data+i%*Size)=13
2630 count?i%none
2640 ENDPROC
2650 :
2660 DEF PROCswap(a$,b%)
2670 LOCAL i%,t%
2680 FOR i%=0 TO Size-1 STEP 4
2690 t%=i!(Data+a%*Size)
2700 i!(Data+a%*Size)=i!(Data+b%*Size)
2710 i!(Data+b%*Size)=t%
2720 NEXT
2730 ENDPROC
2740 :
2750 DEF FNitem(i%)
2760 IF i%>maxitems THEN =""
2770 =$(Data+i%*Size)
2780 :
2790 DEF FNTotal(i%)
2800 =!(Data+i%*Size+Total)
2810 :
2820 DEF PROCsetdate(i%,d$,m$,n%)
2830 mem=Data+i%*Size+d%*4
2840 days=FNfromtext(d$)
2850 mem!Dates=days*256 OR n%
2860 ENDPROC
2870 :
2880 DEF FNfromtext(a$)
2890 LOCAL dy,mo,yr,day,year
2900 IF MID$(a$,3,1)<>" " OR MID$(a$,7,
1)<>" " PRINT"Unknown date :";a$;END
2910 dy=VALMID$(a$,1,2)
2920 yr=VALMID$(a$,8,4)
2930 mo=FNmonthnum(MID$(a$,4,3))
2940 day=dy-1+day(mo)-(FNleap(yr) AND m
o>1)
2950 IF yr=1990 THEN =day
2960 FOR year=1990 TO yr-1
2970 day=day+day-FNleap(year)
2980 NEXT
2990 =day
3000 :
3010 DEF FNTotext(day)
3020 LOCAL dy,mo,yr,got
3030 yr=1990
3040 got=FALSE
3050 REPEAT
3060 diy=day-FNleap(yr)
3070 IF diy>=diy yr=yr+1:day=day-diy EL
SE got=TRUE
3080 UNTIL got
3090 mo=12
3100 REPEAT
3110 mo=mo-1
3120 dtm=day(mo)-(FNleap(yr) AND mo>1)
3130 UNTIL day>=dtm
3140 dy=day-dtm+1
3150 =RIGHT$( "00"+STR$(dy,2)+" "+MID$(mo
n$,mo*3+1,3)+" "+STR$(yr
3160 :
3170 DEF FNleap(y)
3180 IF (y MOD 400)=0 THEN =TRUE
3190 IF (y MOD 100)=0 OR (y MOD 4)<>0 T
HEN =FALSE
3200 =TRUE
3210 :
3220 DEF PROCshow(first)
3230 LOCAL i
3240 i=0
3250 REPEAT
3260 PRINTTAB(0,i+3);FLine(first,i);
3270 i=i+1
3280 UNTIL i+first-1=items OR i=scrmax
OR i+first-1=maxitems-1
3290 ENDPROC
3300 :
3310 DEF FLine(i%)
3320 LOCAL l$,c$
3330 l$=CHR$(129)+CHR$(9)+CHR$(9)+CHR$(9)
3340 IF l$=items l$=l$+" " ELSE IF l%<
10 l$=l$+" "+CHR$(48+1%) ELSE l$=l$+" "
3350 c%=count?l%
3360 IF c%=none c$="" ELSE IF c%=0 c$=""
X" ELSE c$=STR$(count?l%)
3370 =LEFT$(l$+CHR$(131)+CHR$(9)+FNitem(1%)
+STR$(40," " ),maxlen+9)+RIGHT$( " "+
c$,3)+" "+CHR$(156)
3380 :
3390 DEF PROCbar(ypos,switch)
3400 VDU 31,1,ypos+3:IF switch VDU 133,
157,135 ELSE VDU 32,32,32
3410 VDU 31,7,ypos+3:IF switch VDU 135
ELSE VDU 32
3420 ENDPROC
3430 :
3440 DEF PROCedit
3450 PROCcls
3460 IF items=0 list$="NewList":PROCsho
wname(list$)
3470 top=0
3480 pos=0
3490 PROCshow(top)
3500 PROCbar(pos,1)
3510 REPEAT
3520 cur=top+pos
3530 IF cur=items VDU 31,8+LENFNitem(cu
r),3+pos:PROCcursor(1)
3540 key$=GET$
3550 PROCcursor(0)
3560 ctrl=INKEY-2
3570 oldtop=top
3580 oldpos=pos
3590 update=FALSE
3600 IF cur=items PROCendoflist ELSE PR
OCmidlist
3610 IF key$=CHR$(140) AND key$<=CHR$(149)
PROCgoto(ASCkey$-140)
3620 IF key$=CHR$(138) PROCdown
3630 IF key$=CHR$(139) PROCup
3640 IF update PRINTTAB(0,3+pos);FLine
(cur);
3650 IF pos<oldpos PROCbar(oldpos,0):P
ROCbar(pos,1)
3660 UNTIL key$=CHR$(27)
3670 ENDPROC
3680 :
3690 DEF PROCmidlist
3700 IF key$=CHR$(13) PROCedittext
3710 IF key$="1" AND key$<="9" PROCbuy
(cur,VALkey$)
3720 IF key$="+" PROCbuy(cur,1)
3730 IF key$="-" PROCbuy(cur,-1)
3740 IF key$=CHR$(127) PROCbuy(cur,none)
3750 IF key$="X" PROCbuy(cur,0)
3760 ENDPROC
3770 :
3780 DEF PROCendoflist
3790 IF key$=CHR$(21) OR (key$>=" " AND k
ey$<=CHR$(127)) PROCusekey(items,key$)
3800 IF key$=CHR$(13) PROCnewitem
3810 ENDPROC
3820 :
3830 DEF PROCedittext
3840 REPEAT
3850 VDU 31,8+LENFNitem(cur),3+pos
3860 PROCcursor(1)
3870 ekey$=GET$
3880 PROCcursor(0)
3890 IF ekey$=CHR$(21) OR (ekey$>=" " AND
ekey$<=CHR$(127)) PROCusekey(cur,ekey$)
3900 UNTIL ekey$=CHR$(13) AND FNitem(cur)
<=""
3910 key$=""
3920 ENDPROC
3930 :
3940 DEF PROCusekey(i%,k$)
3950 a$=FNitem(i%)
3960 IF k$=CHR$(127) AND a$<>" " VDU 127:a
$=LEFT$(a$,LENa$-1)
3970 IF k$=" " AND k$<=CHR$(127) AND LENa
$<maxlen a$=a$+k$:PRINTk$;
3980 IF k$=CHR$(21) PRINTSTRING$(LENa$,CH
R$(127));a$=""
3990 $(Data+i%*Size)=a$
4000 ENDPROC
4010 :
4020 DEF PROCnewitem
4030 IF FNitem(items)="" ENDPROC
4040 IF items<maxitems items=items+1
4050 PROCclear(items)
4060 PROCshow(top)
4070 PROCdown
4080 dosave=TRUE
4090 ENDPROC
4100 :
4110 DEF PROCscroll(dir%)
4120 PROCbar(pos,0)
4130 VDU 28,0,scrmax+2,39,3
4140 IF dir%=1 VDU 31,0,scrmax+1,10
4150 IF dir%=-1 VDU 30,11
4160 VDU 26
4170 top=top+dir%
4180 PROCbar(pos,1)
4190 ENDPROC
4200 :
4210 DEF PROCdown
4220 IF top+pos>=items ENDPROC
4230 IF top+pos>=maxitems-1 ENDPROC
4240 IF ctrl PROCgotoend:ENDPROC
4250 IF pos<scrmax-1 pos=pos+1:ENDPROC
4260 PROCscroll(1)
4270 PRINTTAB(0,2+scrmax);FLine(top+po
s);
4280 ENDPROC
4290 :
4300 DEF PROCgotoend
4310 IF items>scrmax-1 PROCsettoppos(i
tems-scrmax+1,scrmax-1):ENDPROC
4320 pos=items
4330 IF pos>maxitems pos=pos-1
4340 ENDPROC
4350 :
4360 DEF PROCup
4370 IF top+pos<=0 ENDPROC
4380 IF ctrl PROCsettoppos(0,0):ENDPROC
4390 IF pos<0 pos=pos-1:ENDPROC
4400 PROCscroll(-1)
4410 PRINTTAB(0,3);FLine(top);
4420 ENDPROC
4430 :
4440 DEF PROCsettoppos(t%,p%)
4450 top=t:pos=p%
4460 IF top<oldtop PROCshow(top)
4470 ENDPROC
4480 :
4490 DEF PROCgoto(where)
4500 IF where>items-1 ENDPROC
4510 pos=where-top
4520 IF pos<0 PROCsettoppos(where,0)
4530 ENDPROC
4540 :
4550 DEF PROCbuy(i%,n%)
4560 count?i%=n%
4570 update=TRUE
4580 :
4590 :
4600 DEF PROCdbuy(i%,n%)
4610 LOCAL c%
4620 c%=count?i%
4630 IF c%=none c%=0
4640 c%=c%+n%
4650 IF c%=none c%=254
4660 IF c%=0 c%=none
4670 PROCbuy(i%,c%)
4680 ENDPROC
4690 :
4700 DEF PROCsave
4710 IF items=0 ENDPROC
4720 FOR item=0 TO items-1
4730 IF count?item<none dosave=TRUE
4740 NEXT
4750 IF dosave=FALSE ENDPROC
4760 PROCcls
4770 new$=FList("save",list$)
4780 IF new$="" ENDPROC
4790 out=OPENOUT(new$)
4800 CLOSEout
4810 list$=new$
4820 PROCshowname(list$)
4830 PROCcheckout
4840 PROCsortlist
4850 PROCsavelist(list$)
4860 dosave=FALSE
4870 ENDPROC
4880 :
4890 DEF PROCcheckout
4900 FOR item=0 TO items-1
4910 IF count?item<none PROCpurchase(1
tem,count?item):count?item=none:sorted=F
ALSE:dosave=TRUE
4920 NEXT
4930 ENDPROC
4940 :
4950 DEF PROCpurchase(i%,n%)
4960 mem=Data+i%*Size
4970 mem!Total=mem!Total+n%
4980 mem=mem+Dates
4990 slot=-1
5000 REPEAT
5010 slot=slot+1
5020 entry=mem!(slot*4)
5030 UNTIL entry=0 OR (entry DIV 256)=t
oday OR slot=maxslots
5040 IF slot=maxslots PROCshuffe(mem,m
axslots):slot=maxslots-1:entry=0
5050 mem!(slot*4)=today*256 OR (n% MOD
256)
5060 ENDPROC
5070 :
5080 DEF PROCshuffe(from,words)
5090 LOCAL i%
5100 FOR i%=0 TO words-1
5110 from!(i%*4)=from!(i%*4+4)
5120 NEXT
5130 from!(i%*4)=0
5140 ENDPROC
5150 :
5160 DEF PROCsortlist
5170 IF sorted ENDPROC
5180 LOCAL i,j,k
5190 FOR i=0 TO items-1
5200 k=i
5210 FOR j=i TO items-1
5220 IF FNtotal(j)>FNtotal(k) k=j
5230 NEXT
5240 PROCswap(i,k)
5250 PROCinform("Sorting",FNitem(i))
5260 NEXT
5270 sorted=TRUE
5280 ENDPROC
5290 :
5300 DEF PROCsavelist(name$)
5310 out=OPENOUT(name$)
5320 PROCwrite("list:",">"+name$)
5330 PROCwrite("last:",today$)
5340 FOR item=0 TO items-1
5350 PROCinform("Saving",FNitem(item))
5360 BPUTout,10
5370 PROCwrite("item:",FNitem(item))
5380 PROCwrite("total:",STR$(FNTotal(it
em)))
5390 mem=Data+item*Size+Dates
5400 i=0
5410 REPEAT
5420 date=mem!(i*4)
5430 IF date<>0 PROCwritedate(date)
5440 i=i+1
5450 UNTIL date=0 OR i=maxslots
5460 NEXT
5470 CLOSE out
5480 ENDPROC
5490 :
5500 DEF PROCwritedate(d%)
5510 LOCAL date$,n%
5520 date$=FNtotext(d% DIV 256)
5530 n%=d% MOD 256
5540 IF n%<1 date$=date$+" (" +STR$(n%+
")"
5550 PROCwrite("date:",date$)
5560 ENDPROC
5570 :
5580 DEF PROCwrite(f$,d$)
5590 PROCstrput(out,LEFT$(f$+STRING$(8,
" " ),8)+d$+CHR$(10)
5600 ENDPROC
5610 :
5620 DEF PROCstrput(file,estr$)
5630 LOCAL i%
5640 FOR i%=1 TO LENestr$
5650 BPUT #file,ASC MID$(estr$,i,1)
5660 NEXT
5670 ENDPROC
5680 :
5690 DEF PROCprint(a$)
5700 IF tofile PROCstrput(out,a$+CHR$(10)
):ENDPROC
5710 PRINTa$
5720 ENDPROC
5730 :
5740 DEF PROClist
5750 IF items=0 ENDPROC
5760 PROCcls
5770 to$=FList("save","SL"+LEFT$(today$
,2)+RIGHT$( "00"+STR$(1+FNmonthnum(MID$
(today$,4,3))),2))
5780 PROCcheckout
5790 VDU 28,0,23,39,2,12
5800 tofile=TRUE
5810 low$=FNlow(to$)
5820 IF low$=vdu: " OR low$=" tofile=F
ALSE
5830 IF low$="printer:" tofile=FALSE:VD
U 2
5840 IF tofile out=OPENOUT(to$)
5850 PROCprint(list$+" shopping list on
"+today$+CHR$(10)
5860 FOR item=0 TO items-1
5870 dates=0
5880 FOR slot=0 TO maxslots-1
5890 entry=Data!(item*Size+Dates+slot*4)
5900 date(slot)=entry DIV 256
5910 num(slot)=entry MOD 256
5920 IF entry>0 dates=dates+1
5930 NEXT
5940 IF dates>1 PROCcalculate
5950 NEXT
5960 VDU 3
5970 IF tofile CLOSEout ELSE PRINT"Pr
ess any key to continue":IFGET
5980 VDU 12,26
5990 ENDPROC
6000 :
6010 DEF PROCcalculate
6020 IF dates=0 ENDPROC
6030 period=dates-dates-date(0)
6040 i=dates-1
6050 used=0
6060 REPEAT
6070 IF i>0 used=used+num(i)
6080 i=i-1
6090 UNTIL i<0
6100 IF used=0 ENDPROC
6110 last=num(dates)
6120 IF last=0 last=1
6130 i=dates
6140 REPEAT
6150 IF num(i)=0 i=i-1
6160 UNTIL num(i)>0
6170 timegap=(date(i)-date(0))/i
6180 IF last=period/used:date(dates)<to
day+timegap/2 PROCprint(" "+FNitem(item)
)
6190 ENDPROC

```




Pieces of Eight

Listing 1

```
10 REM SVPicSrc (Po81)
20 REM by David Acton/Bruce Smith
30 REM For B/B+/M/E
40 REM (C) BAU Sep 91
50 :
60 PROCAssemble
70 PROCchecksum
80 *SAVE SVPIC 2E00 2FFF
90 END
100 :
110 DEF PROCAssemble
120 FOR pass=0 TO 3 STEP 3
130 P%=&2E00
140 [OPT pass
150 STY &84
160 LDA &801
170 STA &83
180 LDA &802
190 STA &82
200 JSR writecat
210 LDA &800
220 STA &83
230 LDA &8FF
240 STA &86
250 STA &87
260 LDA &801
270 STA &82
280 .restart
290 LDA &802
300 STA &88
310 LDA &803
320 STA &79
330 .redo
340 LDA &800
350 STA &80
360 STA &81
370 JSR subone
380 LDA &81
390 CMP &87
400 BCC forward10
410 BNE roll
420 LDA &80
430 CMP &86
440 BCS roll
450 .forward10
460 LDA &80
470 STA &86
480 LDA &81
490 STA &87
500 LDA &82
510 STA &85
520 LDA &88
530 STA &89
540 LDA &79
550 STA &8A
560 .roll
570 SEC
580 ROL &79
590 INC &88
600 LDA &88
610 CMP &809
620 BNE redo
630 INC &82
640 LDA &82
650 CMP &809
660 BNE restart
670 LDA &801
680 STA &83
690 LDA &85
700 STA &82
710 LDX &808
720 STX &73
730 JSR transfer
740 LDX &808
750 LDA &89
760 STA &88
770 JSR transfer
780 LDA &8A
790 STA &79
800 JSR subone
810 JMP subtwo
820 .subone
830 LDA &82
840 STA &7E
850 SEC
860 SBC &801
870 STA &7F
880 .doall
890 JSR copy
900 LDA &7F
910 STA &70
920 .allagain
930 LDY &800
940 LDA (&70),Y
950 LDY &7E
960 CMP (&70),Y
970 BEQ over16
980 CLC
990 JSR subthree
1000 LDX &7A
1010 LDY &800
1020 LDA (&70),Y
1030 JSR transfer
1040 JMP forward
1050 .over16
1060 STA &78
```

```
1070 LDY &803
1080 STY &77
1090 .back11
1100 INC &77
1110 JSR addthem
1120 BHI setcarry
1130 LDA &77
1140 CMP &79
1150 BEQ setcarry
1160 LDA (&70),Y
1170 CMP &78
1180 BEQ back11
1190 .setcarry
1200 SEC
1210 JSR subthree
1220 LDA &77
1230 LDX &88
1240 JSR transfer
1250 LDA &78
1260 LDX &7A
1270 JSR transfer
1280 LDA &70
1290 SEC
1300 SBC &7E
1310 STA &70
1320 LDA &71
1330 SBC &800
1340 STA &71
1350 .forward
1360 JSR addthem
1370 BPL allagain
1380 DEC &7F
1390 BPL doall
1400 RTS
1410 .subtwo
1420 LDX &808
1430 LDA &800
1440 JSR transfer
1450 LDA &800
1460 LDY &75
1470 JMP &FFCE
1480 .subthree
1490 ROL &74
1500 DEC &73
1510 BNE return
1520 INC &80
1530 BNE nohigh
1540 INC &81
1550 .nohigh
1560 LDA &83
1570 BEQ noput
1580 LDY &75
1590 LDA &74
1600 JSR &FFD4
1610 .noput
1620 LDA &808
1630 STA &73
1640 .return
1650 RTS
1660 .transfer
1670 LSR A
1680 PHA
1690 JSR subthree
1700 PLA
1710 DEX
1720 BNE transfer
1730 RTS
1740 .copy
1750 LDA &7C
1760 STA &70
1770 LDA &7D
1780 STA &71
1790 RTS
1800 .addthem
1810 LDA &70
1820 CLC
1830 ADC &7E
1840 STA &70
1850 LDA &71
1860 ADC &800
1870 STA &71
1880 RTS
1890 .writecat
1900 LDA &84
1910 CLC
1920 ADC &F2
1930 TAX
1940 LDA &F3
1950 ADC &800
1960 TAY
1970 LDA &80
1980 JSR &FFCE
1990 STA &75
2000 LDA &808
2010 STA &73
2020 LDA &884
2030 LDX &800
2040 LDY &800
2050 JSR &FFFD4
2060 STX &7C
2070 STY &7D
2080 JSR copy
2090 LDY &800
2100 LDX &801
2110 STX &7A
2120 STX &7F
2130 .back10
2140 STX &7E
2150 LDA &7A
```

```
2160 CMP (&70),Y
2170 BCS over8
2180 SEC
2190 ROL &7A
2200 INX
2210 BNE back10
2220 .over8
2230 JSR addthem
2240 BPL back10
2250 STX &7A
2260 LDX &808
2270 LDA &7A
2280 JSR transfer
2290 LDX &855
2300 LDY &800
2310 LDA &8A0
2320 JSR &FFFD4
2330 TXA
2340 LDX &808
2350 JSR transfer
2360 LDX &80F
2370 .back17
2380 TXA
2390 STA &8B
2400 PHA
2410 LDX &80B
2420 LDY &800
2430 LDA &80B
2440 JSR &FFFD1
2450 LDA &8C
2460 LDX &804
2470 JSR transfer
2480 PLA
2490 TAX
2500 DEX
2510 BPL back17
2520 RTS
2530 ]
2540 NEXT
2550 ENDPROC
2560 :
2570 DEF PROCchecksum
2580 C%=0
2590 FOR X%=&2E00 TO &2FAE
2600 C%=(C%+X%)
2610 NEXT
2620 IF C%=&50668 THEN ENDPROC
2630 VDU 7
2640 PRINT "Checksum error!"
2650 END
```

Listing 2

```
10 REM LDPicSrc (Po82)
20 REM by David Acton/Bruce Smith
30 REM for B/B+/M/E0
40 REM (c) BAU Sep 91
50 :
60 PROCvars
70 PROCAssemble
80 PROCchecksum
90 *SAVE Ldpic 2E00 2F35
100 END
110 :
120 DEF PROCvars
130 osbyte=&FFFD4:osfind=&FFCE
140 oswrch=&FFFE:osbget=&FFD7
150 ENDPROC
160 :
170 DEF PROCAssemble
180 FOR pass=0 TO 3 STEP 3
190 P%=&2E00
200 [OPT pass
210 LDA &805
220 CLC
230 ADC &F2
240 TAX
250 LDA &F3
260 ADC &800
270 TAY
280 LDA &840
290 JSR osfind
300 CMP &800
310 BNE noerror
320 BRK
330 ]
340 ?P%=&D6:P%=&P%+1
350 $P%="No Screen File"
360 P%=&P%+LEN($P%)
370 [OPT pass
380 BRK
390 .noerror
400 STA &75
410 LDA &801
420 STA &73
430 LDX &808
440 JSR subroutinel
450 STA &7A
460 LDX &808
470 JSR subroutinel
480 STA &7B
490 LDA &8A0
500 LDX &855
510 JSR osbyte
520 TXA
530 CMP &7B
540 BEQ nochange
550 LDA &816
560 JSR oswrch
```

```
570 LDA &7B
580 JSR oswrch
590 LDX &809
600 .nextbyte
610 LDA buffer,X
620 JSR oswrch
630 DEX
640 BPL nextbyte
650 .nochange
660 LDA &884
670 LDX &800
680 LDY &800
690 JSR osbyte
700 STX &7C
710 STY &7D
720 LDX &80F
730 .loop
740 LDA &813
750 JSR oswrch
760 TXA
770 PHA
780 JSR oswrch
790 LDA &804
800 JSR subroutinel
810 JSR oswrch
820 LDA &800
830 JSR oswrch
840 JSR oswrch
850 JSR oswrch
860 PLA
870 TAX
880 DEX
890 BPL loop
900 LDX &808
910 JSR subroutinel
920 STA &7E
930 LDX &808
940 JSR subroutinel
950 STA &88
960 LDA &7E
970 STA &7F
980 .redo
990 JSR swap
1000 LDA &7F
1010 SEC
1020 SBC &801
1030 STA &70
1040 .rightback
1050 JSR subroutinel2
1060 BCC forward
1070 LDX &88
1080 JSR subroutinel
1090 LDA &77
1100 LDX &7A
1110 JSR subroutinel
1120 STA &78
1130 LDY &800
1140 .goback
1150 LDA &78
1160 STA (&70),Y
1170 JSR addmove
1180 DEC &77
1190 BNE goback
1200 JMP ahead
1210 .forward
1220 LDX &7A
1230 JSR subroutinel
1240 LDY &800
1250 STA (&70),Y
1260 JSR addmove
1270 .ahead
1280 LDA &71
1290 BPL rightback
1300 DEC &7F
1310 BEQ carryon
1320 JMP redo
1330 .carryon
1340 LDA &800
1350 LDY &75
1360 JMP osfind
1370 .subroutine2
1380 DEC &73
1390 BNE noget
1400 LDY &75
1410 JSR osbget
1420 STA &74
1430 LDA &808
1440 STA &73
1450 .noget
1460 ASL &74
1470 RTS
1480 .subroutinel
1490 STX &79
1500 LDA &808
1510 SEC
1520 SBC &79
1530 STA &79
1540 LDA &800
1550 STA &76
1560 .nextbit
1570 JSR subroutinel2
1580 ROR &76
1590 DEX
1600 BNE nextbit
1610 LDX &79
1620 BEQ return
1630 .trynext
1640 CLC
1650 ROR &76
```



```

1660 DEX
1670 BNE trynext
1680 .return
1690 LDA #76
1700 RTS
1710 .swap
1720 LDA #7C
1730 STA #70
1740 LDA #7D
1750 STA #71
1760 RTS
1770 .addmove
1780 LDA #70
1790 CLC
1800 ADC #7E
1810 STA #70
1820 LDA #71
1830 ADC #600
1840 STA #71
1850 RTS
1860 .buffer
1870 ]
1880 NEXT
1890 ENDPROC
1900 :
1910 DEF PROCchecksum
1920 C% = 0
1930 FOR X% = &2E00 TO &2F32
1940 C% = C% + X%
1950 NEXT
1960 IF C% = 37790 THEN ENDPROC
1970 VDU 7
1980 PRINT "Checksum error!"
1990 STOP

```

Listing 3

```

10 REM Mode Convertor (Po83)
20 REM by Phil Wilkes
30 REM for B/B+/M/E
40 REM (c) BAU Sep 91
50 :
60 MODE 4
70 PROCTables
80 PROCcode
90 PROCchecksum
100 PROCsave
110 END
120 :
130 DEF PROCTables
140 even10% = &1600
150 even20% = &1800
160 even21% = &1880

```

```

170 odd10% = &1700
180 odd20% = &1840
190 odd21% = &18C0
200 pointer% = &70
210 PRINTTAB(0,10) "Please wait - creat
ing conversion tables"
220 mask% = &88
230 FOR screen% = 0 TO 255
240 S% = screen%
250 D% = 0
260 E% = 0
270 FOR pix% = 0 TO 3
280 C% = S% AND mask%
290 IF C% = 136 THEN D% = D% + 1: E% = E% + 3
300 IF C% = 128 AND (pix% MOD 2) = 1 THEN
D% = D% + 1: E% = E% + 3
310 IF C% = 128 AND (pix% MOD 2) = 0 THEN
D% = D% + 3: E% = E% + 1
320 IF C% = 8 THEN D% = D% + 1: E% = E% + 2
330 IF pix% < 3 THEN S% = S% * 2: D% = D% * 4: E% =
E% * 4
340 NEXT pix%
350 even10%?screen% = E%
360 odd10%?screen% = D%
370 NEXT screen%
380 mask% = 42
390 FOR screen% = 0 TO 63
400 S% = screen%
410 D% = 0
420 E% = 0
430 FOR pix% = 0 TO 1
440 C% = S% AND mask%
450 IF C% = 42 THEN D% = D% + 15: E% = E% + 15
460 IF C% = 10 THEN D% = D% + 7: E% = E% + 15
470 IF C% = 40 THEN D% = D% + 7: E% = E% + 13
480 IF C% = 8 THEN D% = D% + 7: E% = E% + 13
490 IF C% = 34 THEN D% = D% + 10: E% = E% + 5
500 IF C% = 2 THEN D% = D% + 10: E% = E% + 5
510 IF C% = 32 THEN D% = D% + 8: E% = E% + 2
520 IF pix% = 0 THEN S% = S% * 2: E% = E% * 16: D% =
D% * 16
530 NEXT pix%
540 even20%?screen% = E%
550 odd20%?screen% = D%
560 NEXT screen%
570 FOR screen% = 0 TO 63
580 S% = screen%
590 D% = 0
600 E% = 0
610 FOR pix% = 0 TO 1
620 C% = S% AND mask%
630 IF C% = 42 THEN D% = D% + 51: E% = E% + 51
640 IF C% = 10 THEN D% = D% + 49: E% = E% + 50

```

```

650 IF C% = 40 THEN D% = D% + 48: E% = E% + 48
660 IF C% = 8 THEN D% = D% + 16: E% = E% + 32
670 IF C% = 34 THEN D% = D% + 18: E% = E% + 33
680 IF C% = 2 THEN D% = D% + 3: E% = E% + 3
690 IF C% = 32 THEN D% = D% + 1: E% = E% + 2
700 IF pix% = 0 THEN S% = S% * 2: E% = E% * 4: D% =
D% * 4
710 NEXT pix%
720 even21%?screen% = E%
730 odd21%?screen% = D%
740 NEXT screen%
750 ENDPROC
760 :
770 DEF PROCcode
780 P% = &1500
790 ]
800 .ch10
810 LDA #0
820 STA pointer%
830 TAX
840 LDA #630
850 STA pointer% + 1
860 .loop
870 LDA (pointer%, X)
880 TAY
890 LDA even10%, Y
900 STA (pointer%, X)
910 INC pointer%
920 LDA (pointer%, X)
930 TAY
940 LDA odd10%, Y
950 STA (pointer%, X)
960 INC pointer%
970 BNE loop
980 INC pointer% + 1
990 BPL loop
1000 RTS
1010 .ch20
1020 LDA #0
1030 STA pointer%
1040 TAX
1050 LDA #630
1060 STA pointer% + 1
1070 .loop2
1080 LDA (pointer%, X)
1090 AND #63
1100 TAY
1110 LDA even20%, Y
1120 STA (pointer%, X)
1130 INC pointer%
1140 LDA (pointer%, X)
1150 AND #63
1160 TAY

```

```

1170 LDA odd20%, Y
1180 STA (pointer%, X)
1190 INC pointer%
1200 BNE loop2
1210 INC pointer% + 1
1220 BPL loop2
1230 RTS
1240 .ch21
1250 LDA #0
1260 STA pointer%
1270 TAX
1280 LDA #630
1290 STA pointer% + 1
1300 .loop1
1310 LDA (pointer%, X)
1320 AND #63
1330 TAY
1340 LDA even21%, Y
1350 STA (pointer%, X)
1360 INC pointer%
1370 LDA (pointer%, X)
1380 AND #63
1390 TAY
1400 LDA odd21%, Y
1410 STA (pointer%, X)
1420 INC pointer%
1430 BNE loop1
1440 INC pointer% + 1
1450 BPL loop1
1460 RTS
1470 ]
1480 ENDPROC
1490 :
1500 DEF PROCchecksum
1510 total% = 0
1520 FOR i% = &1500 TO P% - 1
1530 total% = total% + i%
1540 NEXT i%
1550 IF total% <> 14701 PRINT "Checksum er
ror in assembler." : VDU 7: END
1560 total% = 0
1570 FOR i% = &1600 TO &18FF
1580 total% = total% + i%
1590 NEXT i%
1600 IF total% <> 104872 PRINT "Checksum e
rror in tables." : VDU 7: END
1610 ENDPROC
1620 :
1630 DEF PROCsave
1640 *SAVE CONVERT 1500 1900
1650 ENDPROC

```

Notes

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Philips CM8833 II Colour Monitor	£209.00
Microvitec CUB 3000	£199.00
Taxan MultiVision 775 (0.28 d.p.)	£389.00
Taxan MultiVision 795A (0.26 d.p.)	£469.00

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Arc to Monitor + Audio 2m (Not 8833 II)	£8.65
Arc to 8833 Mk II Monitor Cable + Audio	£8.65
Arc Parallel Printer Cable 1.8m	£5.25
Arc to BBC Serial Cable 2m	£6.95
Arc Keyboard Extension Cable 2m	£7.75
Arc Mouse Extension Cable 2m	£7.75
Arc Keyboard Replacement Cable	£6.95
Arc Mouse Replace. Cable (State Type)	£6.95

We can supply almost any cable made to order.

Please call for details.

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Items marked with an * can be used on A300/540

1Mb Ram Upgrade	£39.00
2Mb Ram Upgrade	£75.00
3Mb Ram Upgrade	£105.00
Above memory fitted for £10.00	
Acorn SCSI Card	£239.00*
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Com. Con. Sheet Feeder for above	£149.00*
Com. Con. Scan-Light + Feeder	£454.00*
Com. Con. Scan-Light Junior	£174.00*
Com. Con. Scan-Light 256	£205.00
Lingenuity SCSI Card	£169.00*
VIDC Enhancer	£27.00
Econet Module	£48.00*
Beebug Disc Buffer	£29.00

A3000 Accessories

Orion 1 Mb Ram Upgrade	£55.00
(Expandable to 4Mb using only a total of 8 chips)	
Orion 3 Mb Ram Upgrade	£156.00
Serial Upgrade	£18.00
PRES Disc Buffer Board	£48.95
PRES Monitor Stand	£24.95
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CC Scanlight A4 Mk II A3000	£369.00
CC Sheetfeeder for A4 Scanner	£149.00
CC Scanlight A4 + Sheetfeeder	£454.00
CC Scanlight 256	£205.00
RTFM Joystick Interface + S/W Disk	£34.95
Serial Port Joystick Interface	£18.95
Voltmace DeltaCat Joystick	£26.00

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Programmers Reference Manuals	£77.00
BASIC V Guide	£19.45
A3000 Technical Guide	£28.95
A540 Technical Guide	£65.00
Basic V: A Dabhand Guide	£9.95
Archimedes First Steps	£9.95
Archimedes Assembly Language	£14.95
Budget DTP: A Dabhand Guide NEW	£12.95

Extra Manuals

Acorn D.T.P.	£10.00
1st Word Plus Release 2	£10.00
ANSI C Release 3	£20.00

Printers

C.C. Qume Laser Direct	£859.00
C.C. 600 DPI Expansion Card	£309.00
Canon LBP4 Laser for above	£699.00
C.C. 600 DPI LBP8 Laser Direct	£1319.00
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Star LC24-200 Colour	£249.00
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Please call for latest prices on original and compatible branded ribbons. We do not sell "White Box" compatible ribbons.

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Orion SCSI drives are high speed, typically 750K per second, and the external drives come in a small case. Price includes SCSI expansion card. Please call for current prices. We can supply most drive capacities.

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Boogie Buggy (4th Dim.)	NEW £18.00
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Twin World (Cygnus)	£14.45
Saloon Cars (4th Dim.)	NEW £18.00
Wonderland (Virgin)	NEW £24.50
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5 1/4

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3 1/2

MF/2DD 1Meg

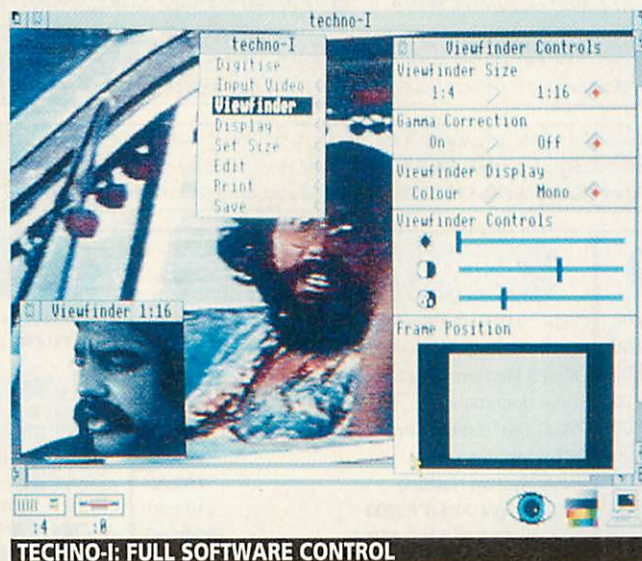
£9.75	£19.50	£34.00	£77.50	£145.00	£270.00
Sony Bulk	£12.50	£25.00	£45.00	£106.25	£200.00
				£200.00	£375.00

Discounts available for trade orders - Phone for prices

A computer such as the Archimedes is ideally suited to those applications that need high-resolution colour graphics. The only real drawback is the considerable time needed to design detailed and colourful graphics for programs of this sort.

With colour printing technology in a reasonably advanced state, it is now also possible to include full colour diagrams and pictures in documents, via desktop publishing programs such as *Impression 2*. The results can be excellent; just look at the articles in this magazine for proof.

With the addition of a single podule to convert the incoming



Setting up and using the Techno-I hardware and software is simplicity itself. The built-in test routines allow anyone non-technical to make sure they have the system set up correctly. All the software complies to Risc OS guide lines so anyone already familiar with the desktop environment should be able to use it.

The quality of picture is as good as that from any other colour digitiser on the market. The best results are obtained if you use a multisync monitor because at such a high resolution, the colour dithering works particularly well.

One problem that did arise was a slight disagreement

I-GRABBING

ROB MILLER tries out Techno-I, the Arc podule that grabs your graphics for you

video signal into a machine recognisable form, the Archimedes can be used to 'grab' pictures from a video recorder or camera, and then display them or save them as sprites.

Techno-I from Technomatic Ltd, is the latest colour digitiser for the Archimedes. The package consists of a single-width podule (boxed for the A3000), a disc containing the driver software and a comprehensive manual.

Fitting the Techno-I podule is simply a case of removing the lid from the Archimedes, pushing the podule into an empty slot on the backplane and replacing the machine's lid. For A300 series owners, a backplane will be required if not already fitted to the computer. A special version of the Techno-I podule has been designed for A3000 owners. This comes in its own case and slots into the expansion slot on the back of the computer.

Techno-I will take a number of different sources, including a standard VCR or video camera. These are connected via a standard BNC socket.

An S-VHS upgrade is available (£119.85 inc. VAT) for the podule which allows S-

VHS-compatible equipment, such as the Canon Ion Video-still camera, to be used for better picture quality. No connecting cables are provided with the package so it's worth checking with Technomatic which sort of cable will be best suited to your requirements.

Once the board is fitted and the software loaded, digitising can begin. Two Risc OS applications are provided on the accompanying disc.

!Telly allows you to monitor the incoming video signal via an on-screen viewfinder. The viewfinder can be either 1/16 or 1/4 screensize. Both ratios give a recognisable picture, but the former runs faster.

Any desktop mode can be used and 256-colour modes will give a 'colour' picture in the viewfinder. Although picture quality improves with resolution, the speed at which the viewfinder is updated is greatly reduced, making Mode 15 a good compromise.

Full software control over the brightness, contrast and colour levels is provided via slider controls. Gamma correction – correcting the luminance transfer characteristic of a video system – can be applied

to the picture to preserve the original luminance.

The main application on the disc, *Techno-I*, provides tools to grab and process video pictures. Installing the software is simply a case of double-clicking on the *Techno-I* icon. A 1/16 screensize viewfinder similar to the *!Telly* application is displayed.

Unlike *!Telly*, the *Techno-I* application will only work in 256-colour modes. If an attempt is made to run the application in, for example, Mode 12, the menu-bar icon is crossed out to show that the current mode is unsuitable.

The size to which pictures are converted can be set to anything from 1 x 1 to 1280 x 1024 pixels. The screen mode of the resulting sprite is set automatically by Techno-I; anything higher than 256 pixels vertically is taken to be aimed at a multisync display.

Grabbing a picture is just a case of waiting until the viewfinder displays the required image and then quickly clicking on the Digitise icon. Trouble is, if you're using a moving picture source, timing when to click the mouse button can take a bit of practice.

between the podule and the backplane fitted to the A440/1 being used for the review. The way in which Techno-I communicates through the IIC interface can corrupt the Archimedes Cmos Ram settings, making the machine impossible to use. This only happened occasionally and Technomatic promises to replace any boards that have the compatibility problem.

One final niggle; the metal work on the podule was decidedly second-rate. The screw holes didn't line up correctly with the Arc's casing, and the brackets connecting the metal work to the podule were rather flimsy. A few more pounds could have been spent in improving this.

The package is surprisingly good value compared to the rest of the field. The podule takes up only one podule slot, whereas most other colour digitisers take two.

PRODUCT DETAILS

Techno-I is from Technomatic, 468 Church Lane, London NW9 8UF Tel: 081-205 9558, at £292.58 on the Arc, £327.83 on the A3000.

Archimedes Software

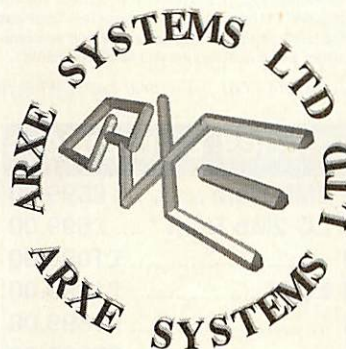
E & OE

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Archimedes Basic Compiler	£73.00
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Investigator 2	£21.00
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Risc Basic	£112.00
Toolkit Plus	£37.00
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Rhapsody (New Version)	£47.00
Superior Speech	£15.00
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Mig 29
Provocator
Real McCoy 2
Saloon Cars
Wonderland

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MultiFS provides the Archimedes with multiple filing system support. It allows the user to read and write to PC, Atari ST and BBC DFS discs from within the desktop environment.

MultiFS Features

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- * Provides Access to DOS partitions
- * Filetypes maintained on DOS discs
- * Filetypes mapped to DOS extensions
- * Formats and creates system discs
- * Supports disc names for DOS

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Panasonic Multiscan	£315.00
Philips CM8833Mk2	£249.00

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trk drive with PSU.	

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SP Graphics Enhancer	£179.00
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Large range of SCSI and ST506 drives available with interfaces at low prices phone for details.

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Dabhand Computing Ltd, 5 Victoria Lane, Whitefield, Manchester M25 6AL. This advert was produced using Impression from Computer Concepts.

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A 410/1	£1099.00
A 420/1 LC **	£1299.00
A 440/1	£1699.00
A 540	£2995.00

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* Pack includes PC Emulator, 1st Word Plus, Genesis. ** + Acorn DTP.

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Ethernet Expansion Card	£249
Floating Point Expansion Card	£449
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Keyboard Extender	£8
Midi Upgrade to I/O Exp. Card	£27
Midi Expansion Card	£65
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Scanlight Junior 256 Grey Level (CC)	£199
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Sheet Feeder for above A4 (CC)	£105
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Please refer to Oak External SCSI prices in the opposite column as prices for A3000 external units are the same.

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1 Mb Ram Upgrade	£56
4Mb upgrade to above board	£130
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Serial Upgrade	£19
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VIDC Enhancer	£29

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2 Mb Ram	£65
3 Mb Ram	£99

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All monitors come with free lead. State type of computer when ordering.

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Taxan 775 Multivision	£389
Taxan 795 Multivision ^	£465
Taxan Viking II Mode 23	£749

^ comes with free VIDC enhancer.

Master 128

Master 128	£369
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5.25" Dual 40/80 no psu	£185
5.25" Dual 40/80 with psu	£199
3.5" Single with psu	£85
3.5" + 5.25" 40/80 no psu	£185
3.5" + 5.25" 40/80 with psu	£209

Printers

Citizen 120D+ (Serial add £20)	£129
Citizen Swift 9	£179
Star LC10	£139
STAR LC200 COLOUR (9 pin)	£199
CANON Bubblejet BJ-10e	£289
Canon Bubblejet BJ-130e	£449
Sheetfeeder for BJ-10e	£59
Citizen Swift 24	£249
Colour Kit for above (also Swift 9)	£39
STAR LC24 - 200	£239
STAR LC24 - 200 COLOUR	£289
Sheetfeeder for LC24 - 200	£69
Integrex Colourjet 132	£519
HP Paintjet	£795
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LASER DIRECT (LPB8 Hi Res.)	£1299

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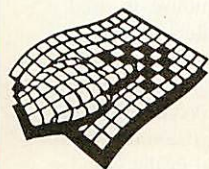
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The above books have accompanying discs add £5 for 5.25", £7 for 3.5"
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A540 Technical Guide £65.00
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Juki 5520 Sprite Dump £26.04
Star LC10 Sprite Dump £26.04

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BubbleJet - BJ10e/130e £10.00



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ArcTerm (Serial Port)	£59.00
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CHOCKS AWAY 2 (Flight Simulator)	£15.00
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Desktop Office (Minerva Integrated Package)	£95.00
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HOOD IN THE WOOD

Adventure games generally involve children taking an active role in a story, where clues have to be followed and problems solved before the adventurer can progress to the next stage. They are very rewarding in that they provide a wealth of stimuli across the curriculum – encouraging reading, thinking and planning.

Selective Software has a history of providing simple yet effective educational adventure games for the eight-bit computer, including programs for infant, junior and lower secondary school pupils, all of which have proved popular both in schools and at home. Topologika has also built quite a name for itself as publishers of educational adventure games with popular packages such as *Giantkiller*, the widely used mathematical adventure, as well as being responsible for classic material like *Count-down to Doom* by Peter Kilworth.

TEDDY BEARS' PICNIC

The character of Freddy Teddy first appeared for the Archimedes and A3000 in a package of three programs, which Topologika published to support matching and sequencing activities for very young children.

Freddy Teddy's Adventure is the first in its series of educational adventures aimed at children aged five to seven. This is a colourful and easy to use educational adventure game set in Freddy's forest. The little bear has lost his honey without which he cannot go to the picnic, and the child's task is to help him find it. The child also has to help Freddy find some nuts, a clock and an invitation.

The adventure is started by clicking on the Teddy icon in the directory viewer. The program is not multi-tasking but it fully utilises the icons, mouse and pointer, encouraging the child to explore the full potential of the machine.



DAVE FUTCHER believes that
adventure games have a definite place
in the classroom and in home education.
Here he looks at two new adventures for
children aged five to seven

At the start of the adventure a number of scenes are shown on the screen, grouped around the main menu. These include a hollow tree, the wood, a picnic site and Freddy Teddy's house and garden. These are the places where the adventure takes place.

To visit a particular scene move the pointer over the required picture and click any mouse button. Once selected, the chosen location is shown, together with a message giving you some information or asking you to search for something at the site. Many of the pictures provided are interactive and as you click on them further messages appear. This is particularly effective for searching tasks, which constitute a major element of *Freddy Teddy's Adventure*.

In one scene the squirrel has lost his winter store of nuts somewhere in the large tree, and Freddy Teddy has to help him search for them. There are all sorts of things to be found – a click on one branch brings up a bird's nest with a parent feeding its young. Eventually the nuts are found in a hollow in the trunk.

As well as searching for specified objects some scenes have puzzles to solve, while others include counting and memorizing objects. In a forest clearing the bears have to be counted as they appear on screen so that the correct number of sandwiches can be made. Furthermore some scenes cannot be visited until certain clues have been collected or other places have been visited.

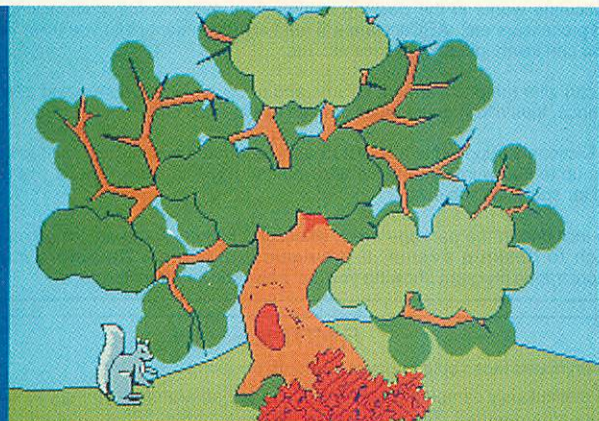
Interestingly the authors have added the dimension of time to the game. This is simulated by incrementing a counter by a random amount each time the mouse is used. When the counter exceeds a program defined value, darkness will fall before the picnic can take place. As all children will understand, bears don't go searching around in the woods late at night!



You cannot enter Freddy
Teddy's garden alone.
Whooooooooo can help ?

Click mouse

WHOOOOO INDEED?



"Will you help me find them ? "

yes no

HOW CAN YOU REFUSE?



The owl says, "I cannot
help you this time."

Click mouse

YOU CAN'T ALWAYS DEPEND ON OWLS

Little Red Riding Hood first appeared for the BBC, and now makes a welcome appearance in an improved package for the A3000. Although well executed with excellent graphics, and music developed with *Tracker*, the program really fails to harness the power of the A3000. Why does it use double-sized text, ignoring the potential of outline fonts? However, as an educational program it still has a great deal to offer.

It is an adventure in two separate parts. The first section follows *Red Riding Hood* as she travels through the forest to her grandma's house. This is not as easy as it at first appears – it is a linear journey on which the children using the program are expected to solve simple problems.

These puzzles generally have a mathematical content, and involve the children collecting a number of objects and remembering some of the things they are told by the various creatures they meet.

The forest is a magical place where plants, animals and other creatures take on a life of their own. Eventually they meet the wolf! Clever graphics and some basic animation make the child feel it is actually happening, but by using something collected on the way the wolf is frightened away and grandma's cottage is finally reached.

The second part of *Little Red Riding Hood* follows the story on from the cottage. Grandma has wandered off into the forest and *Red Riding Hood* has to go looking for her. After a while a bluebird appears to tell her that her grandma has been taken by the Giant to his castle.

This part of the program is more of a true adventure type program where the child is given a choice of movement between a number of locations on an on-screen map using the mouse and pointer. The objective is to help *Red Riding Hood* search for her grandma.

Along the way objects have to be collected and used. For instance, the child has to find a coin to throw into the well for good luck, and a rope to cross the broken bridge. Simple record keeping and map reading skills are also required in this part of the program.

From each location children can only move to an adjacent location connected by a foot path. A clever touch is that a box appears around those areas to which movement is allowed, and the pointer will not move out of the box.

Little Red Riding Hood is a highly motivating program, suitable for children of infant school age.

CONCLUSION

These packages are ideal for anyone with young children. *Freddy Teddy's Adventure* comes with a beautifully produced reading book, full of recognition and counting tasks, while *Little Red Riding Hood* includes an extensive manual with a large number of tasks to follow up.

Both programs successfully create imaginary worlds that young children easily identify with, aimed at such a level that they can be explored without adult supervision.

The puzzles and tasks are not too difficult and most importantly the programs foster much discussion and conversation. Once they have encountered these programs children will want to play them again and again.

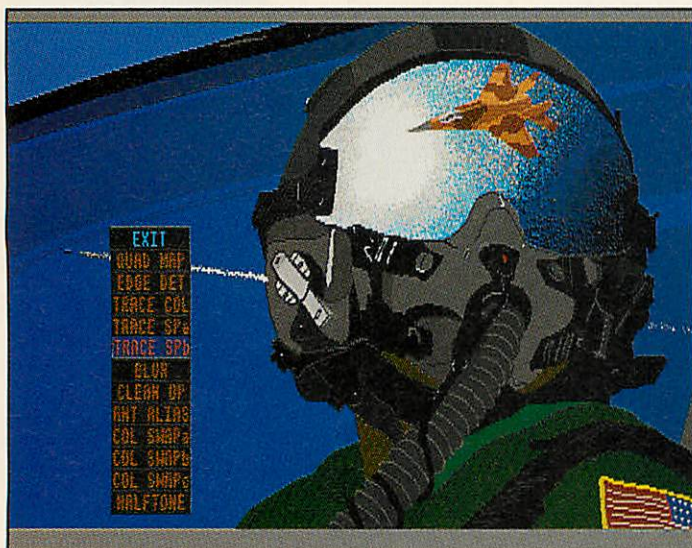
PRODUCT DETAILS

Freddy Teddy's Adventure costs £19.95 and is published by Topologika, PO Box 39, Stilton, Peterborough, PE7 3RL. Tel: (0733) 244682.

Little Red Riding Hood costs £15 and is published by Selective Software, 64 Brooks Road, Street, Somerset, BA16 0PP. Tel: (0458) 43079.

Both are available for the BBC A3000 and Archimedes.

ARctist



"Anybody Can Be an Artist with ARctist"

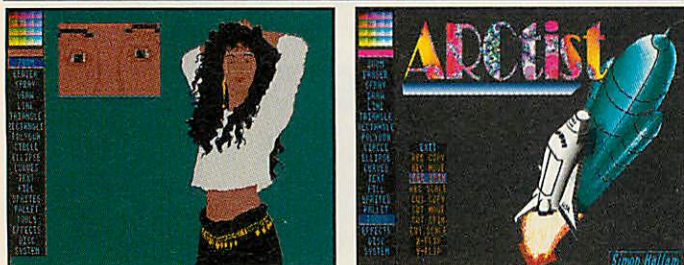
This superb painting program has been designed to be incredibly easy to use and yet totally jam packed with features. Developed with help from educational specialists and professional graphic artists, ARctist is ideally suited to home, school and professional users.

Just a few of ARctist's features include:

- ✓ Full screen 256 colour mode 15 editing. RISC OS compatible.
- ✓ Intelligent spray gun that 'shades' rather than just plotting random dots of colour.
- ✓ Rotation up to 2870% faster than IPaint.
- ✓ Internal handling of up to 30 sprites with auto sprite naming, sorting, grabbing, cutting, instant masking, rotation, scaling etc..
- ✓ Masking tape option lets you mask any part of the screen for spray gun work, then lift off later to reveal what was underneath.
- ✓ Zoom around the screen at high speed and edit with pixel accuracy.
- ✓ Several brush types available with variable size.
- ✓ Undo option undoes the last change you made to a drawing, in case of mistakes.
- ✓ Special effects to distort, detect edges, trace with colours, trace with sprites, swap colours, dither colours, blur, anti alias etc. etc..
- ✓ Special proportionally spaced outline fonts that don't require any memory in the font cache. Put a rectangle around the area you want the text to fit and ARctist will scale it to fit.
- ✓ Rectangle copy, move, rotate and scale. Also, accurate shape cut copy, move, rotate and scale tools to slice out the exact part of the screen you want.
- ✓ Sprite animation with built in sequence editor, offset generator and flight path editor.
- ✓ Load, edit and save fill pattern files. ARctist fill patterns are twice the size of normal ones.
- ✓ Two user definable drawing brushes, can be defined directly or grabbed from anywhere on the screen.
- ✓ Several hundred Kbytes of clip art included.

BBC A3000 & ARCHIMEDES PRICE £24.95

"ARctist" is compatible with the BBC A3000 and 310 & 400 Series



ARcticulate



"The Animated Speech Synthesizer"

This unique and revolutionary speech synthesizer actually has faces that talk to you and to each other. You can choose from 4 main faces and voices - male, female, alien or droid - thereby truly bringing your computer to life!

ARcticulate works in the desktop environment allowing full multi-tasking with word processors etc.. ARcticulate will read any documents that you have written or you can insert jokes, questions etc. etc.

You can alter the pitch, speed, volume and of course voice, during and after any sentence, thus allowing the faces to even talk to each other.

The Dictionary supplied is a RISCOS application and is simplicity itself to use. It holds up to 600 words in any file and you can have as many files as you wish - ideal for specialist subjects.

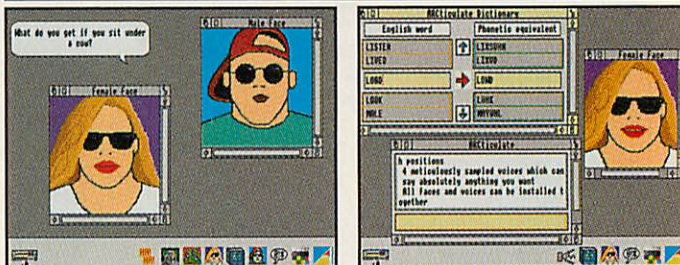
Also included in the package are a selection of jokes, some amusing noises to attach to desktop events, a provisional dictionary file and a superb demonstration program showing you just how articulate ARcticulate is!

FACTFILE

- ✓ 4 animated faces able to cover all mouth positions
- ✓ 4 meticulously sampled voices which can say absolutely anything you want
- ✓ All faces and voices can be installed together
- ✓ An individual face and voice can be installed in less than 120K
- ✓ Very easy to use dictionary application with up to 600 words per file and limitless files
- ✓ Reads text files, word processor documents and can be easily used with your own programs
- ✓ Entertaining Joke program, Demo program and Funny Noises program also included

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ACROSS THE GREAT DIVIDE

DAVE LAWRENCE takes a close look at Cross32 – is it the last word in assemblers?

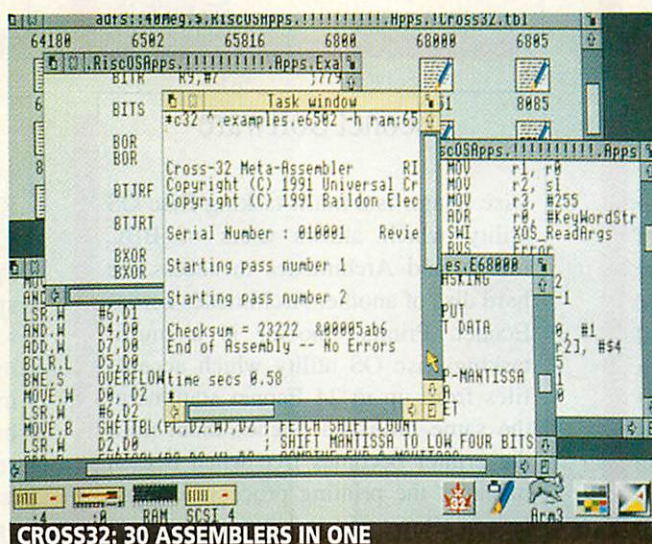
Until now, the Archimedes machine code programmer has had a choice of two assemblers; you could either use the one built in to Basic 5 or lash out 150 quid and use Acorn's own macro assembler *Aasm*. You can't easily assemble large programs with the Basic assembler, it won't warn you if you define a label twice and it has no real macros.

Aasm is a 'proper' assembler and therefore has better error checking, real macros and, most importantly, the ability to link source files together and assemble very large amounts of code. On the whole the built-in Basic assembler is quite adequate for most jobs – *Aasm* need only be used by the most ardent of code hackers.

Unfortunately *Aasm* is far from perfect, so I eagerly awaited the arrival of Baildon Electronics' *Cross32* which Ian Copestake Software has been advertising for the last few months. Described as a 'professional table-based cross-assembler' it is something more than just a simple Arm assembler.

Instead of being tied to one 'target' processor it is capable of assembling code for just about any chip. You need only a so called 'processor table' for the cpu you are using. Tables for over 30 chips are supplied (including Arm, 6502, Z80, 68000, 8086) and it is a relatively simple task to add new ones.

Access to the chip's data sheet and a day or so of spare time should be quite sufficient. Theoretically it would be possible to build a table containing 6502 mnemonics referenced to Arm opcodes, you could then



test out your code at breakneck speed on an Archimedes.

The assembler itself is run from the command line by typing *c32* source -H object. A Risc OS front end is provided for desktop people. This consists of an icon on the icon bar. If a file is dropped on this, it will be assembled in a 'single task window', meaning the assembler does not multi-task. If you desperately need it to, then you can run it from within an *Edit* task window.

As with *Aasm* you can prepare your source file in any text editor, I use *Twin* but you can use *Edit*, *First Word Plus*, *Pipedream* or even *Impression* if you want. There is very little else to say about the actual process of assembling; it works, and it works at a very respectable speed. I've successfully converted a large BBC machine code program into *Cross32* format and it assembles perfectly.

If you are using an Archimedes as a development system and regularly need to

produce code for 'alien' processors, *Cross32* is a wonderful tool; the problem is if you are hoping to move over to *Cross32* from *Aasm* or the Basic assembler.

As *Cross32* was originally written on a PC, there are many features and facilities sadly missing. You cannot use *&* to represent hex numbers; expressions use curly brackets instead of parentheses; you cannot import binary files, meaning data. My *Aasm* can't do this either though – so three cheers for Basic!

You cannot automatically set the file type or the load and execution addresses of the final file (a datafile is produced). The directives used for data storage are non-Acorn standard and are not consistent (for example, *DFB* for *EQUB*, *DLL* for *EQUD*!).

More seriously, there is no automatic method of using a register to access a block of store (*Aasm*'s *^* directive); you cannot nest macro calls, there are no local labels; you cannot

produce code to be used by a linker (Acorn's *ObjAasm* will do this); no cross-referencing information and no looping structures of any sort.

Due to the nature of the processor tables it cannot detect certain illegal Arm instructions such as *MUL r0,r0,r1*. These it will assemble quite happily and then will leave you to figure out just why your code doesn't work.

If you are starting a program from scratch, you could take all these things into account – even the rather serious omissions. However, as an Arm assembler, there is not nearly enough of the functionality of *Aasm* to make it a full replacement. As a cross assembler, though, it's probably miles better than any alternatives.

You may not believe there is any good news, but there is! The authors are currently in the planning stage of version 2 and with any luck, most, if not all of the above criticisms will be removed.

At £175 it represents amazing value for money as you're getting at least 30 assemblers for the price of one. It's just a great shame there are so many omissions. Perhaps if there had been another couple of weeks of field testing, *Cross32* would have been the last word in assemblers. Unless you're desperate for a cross assembler, I'd wait a while for version 2, especially if you want to develop Arm code.

PRODUCT DETAILS

Cross32 on Archimedes disc costs £175 from Ian Copestake Software, 10 Frost Drive, Wirral, Merseyside L61 4XL.

Computer Aided Draughting

Worra CAD is the first CAD system written for the RISC OS Desktop environment. It is a 2D package designed to help the user to produce top quality technical drawings. By taking all the hard work out of creating geometric constructions such as tangents and blended arcs, and by automatically generating dimensions and linestyles, WorraCAD speeds the drawing process and allows high precision output to Plotters and to RISC OS Printer Drivers as well as a wide range of other RISC OS packages (e.g. DTP, Euclid etc.)

WorraCAD

£99.00



BASIC Compiler

The ABC BASIC Compiler is widely regarded by those 'in the know' as the most professional BASIC compiler available for the Archimedes. That's why there are more commercially available packages compiled with ABC than with any other BASIC compiler. Compilation takes place as a RISC OS task. Version 3 has support for the creation of relocatable modules. Modules containing libraries of procedures and functions can be created and called from any other program compiled with ABC (including Genesis II).

ABC Compiler

£69.00



A3000 RAM Upgrades

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Pascal Compiler

The Cambridge Pascal compiler supports a comprehensive version of the Pascal language and includes many extra features such as full string and local error handling. Additional extensions allow the use of random access files and provide direct access to the operating system routines including star commands. The compiler runs under the RISC OS Desktop. Cambridge Pascal comes complete with a library of procedures and functions which support access to the window manager.

Cambridge Pascal £69.00



Econet Software

Disc Sharer is a multi-tasking Risc OS utility which allows users of BBC micros and Archimedes to access the hard disc of another Archimedes across Econet. Printer Spooler is a multi-tasking Risc OS utility which accepts files from up to 24 Econet stations at the same time and queues them until the printer becomes free when it then manages the printing process. Remote Logon allows you to log onto the hard disc of your own machine from a remote machine across Econet with full password protection.

Disc Sharer £137.50

Printer Spooler £81.25

Remote Logon £38.00



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KiddiCAD

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Plotter Driver for Drawfiles

This Risc OS utility allows users of !Draw (and other software that produces drawfiles) to output drawings to HPGL compatible plotters. By simply dragging a drawfile onto the Worra Plotter icon on the icon bar, it will be output as HPGL commands to the selected destination. Pen speed, plotter size and pen configuration may be selected from within Worra Plotter. Worra Plotter will render all CAD type objects and will render text objects in the plotter's own font. Sprites, line thickness, fills and text column objects are ignored.

Worra Plotter

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Up until now the only real way to write complex and speedy 32-bit applications was with the cumbersome *ANSI C Release 3*, or the even more cumbersome *Acorn Assembler*. Compiled Basic was a realistic alternative option to these two.

Now, after four person-years of work, Acorn is ready to release the Desktop Development Environment. The two new products, *Acorn C release 4* and *Assembler release 2*, will replace *Acorn C release 3* and *Assm*. Those existing users wishing to upgrade can expect a discount of about 50 percent.

DDE is designed by Acorn to make the whole process of writing applications and modules a less time-consuming task. And by allowing programs and applications to be written entirely on the desktop it generally makes things easier and more interactive.

A manual explaining the common tools in *DDE*, of which there are a bewildering array, (19 in *C* and 17 in *Assembler*) comes with both packages, together with a manual specific to each package on how to use the compiler or assembler. A tutorial manual is not supplied with either package, so to actually learn how to program in *C* or assembler you will need to look further afield.

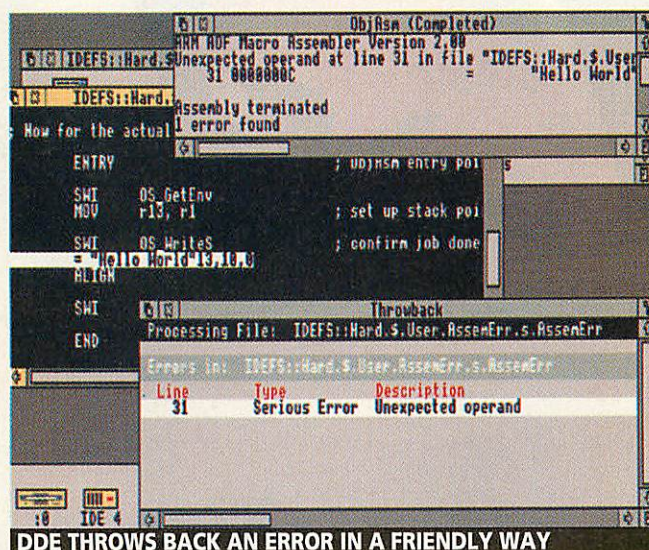
The packages themselves can be run from floppy disc, for the more masochistic, but are obviously at home on a hard disc. Two megabytes of memory, or preferably more, is also a necessity.

The writing of the actual source code is achieved with an enhanced version of *Edit* called *SrcEdit*. Bugs have been fixed and features, such as column tabs and overwrite mode, have been added to ease the use of the application for writing source code. Through the whole of both packages *Help* is a common option. Highlighting a command or directive and choosing *Help* will search through the selected help dictionary, which is set to the language being used, and display an explanation of what the keyword in question is used for.

SrcEdit also supports throw-back in conjunction with the

CONGENIAL CODING

JIM EULER ponders Acorn's friendly new Desktop Development Environment. Will it define the shape of code to come?



Assembler, *ObjAssm* or the *C* compiler, *CC*. With this option turned on any errors detected during compilation will be listed in a window. Double clicking on one of these will bring up the source code in *SrcEdit*, with the offending line highlighted for editing. This certainly saves a great deal of time in getting rid of it.

For the more deep-rooted error that occurs after assembly or compilation then *DDT*, the desktop debugging tool, is a rather impressive line by line debugger. It allows debugging of pre-prepared code, except modules, at machine level. It achieves this by actually stopping the desktop and allowing steps of varying sizes to be taken through the code.

The execution can be stopped at breakpoints, and registers and memory locations can be evaluated. More useful for debugging applications, it can be stopped on a Wimp event or

SWI call. Watchpoints can be set on variables and memory locations, and will tell you when they change. The position within the source code can also be displayed while debugging. *DDT* provides two windows, which aren't Risc Os controlled but behave as though they are.

Make is an application that provides a utility much like the sort of project management program seen on other, bigger computers. When writing large applications, several source code files may be used and *Make* simplifies the process of turning these into the object code. A makefile is a list of the commands used as a recipe to create the object code, and is created by dragging the source code files on to the *Make* window.

The beauty of a makefile is that it will only recompile or re-assemble sources which have been changed.

This form of management is most useful in *C* but also helps with library files and common procedures.

A new version of *FormEd* is also supplied with both packages, the major difference being in the way you select windows for editing. Instead of splattering the windows all over the desktop when you load a template, they are now represented in a *Paint* style browser, and double clicking on a picon of a window will bring it up for editing.

As mentioned before many non-interactive command line tools are included to help make code more efficient, for instance, a patterns finder and a common word finder. *Front-End* is a module that supports all of the non-interactive tools. It provides a simple and quick interface to the wimp and allows single tasking commands and code to multi-task, much like *Edit*'s task window. The assemblers *Assm* and *ObjAssm* use this module, and so does the *C* compiler.

These packages present a very friendly environment for writing code in. They are obviously not for the happy hacker, but for the professional or keen amateur.

The two packages will be available at the end of August. *BAU* will be featuring full reviews of both soon.

PRODUCT DETAILS

Desktop C costs £229+VAT and the Assembler £149+VAT. Contact your local dealer for more details.

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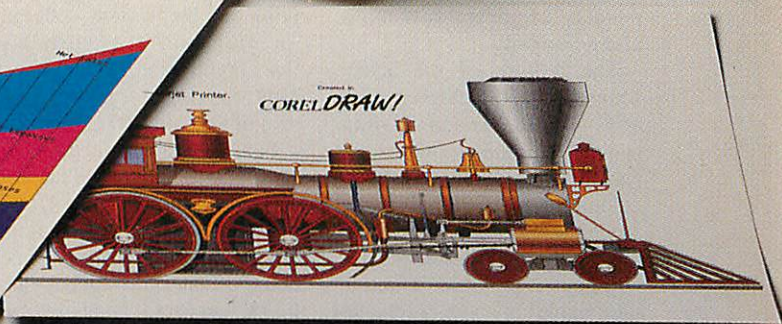
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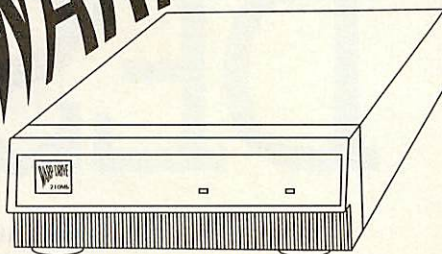
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ACORN R225	ARM3 4Mb RAMPOA
ACORN R260	ARM3 8Mb RAM	
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DESIGN FOR

From medieval castles to computer logic... **CHRIS DRAGE** surveys Data

Data Designs' *Designer Castles* first appeared for the BBC B/Master 128 in 1988 and was quickly voted one of the most innovative programs of that year. Since then an Archimedes' version has followed and a sequel, *Medieval Villages* has been added.

As a departure from the medieval theme, *Designer Environment* and *Designer Logic* widen the perspective of the *Designer* series and broaden its application across the school curriculum. So what is so unique about Data Designs' approach?

The *Designer* software links a computer, printer and human ingenuity in a novel manner. Using the classroom computer, models can be designed and edited on-screen and the results printed as pieces ready for instant assembly into a 3D model with the help of scissors and glue.

The results of designing your own castle/village/environment are really very good, despite the fact that the templates are printed on standard printer paper. A variety of sizes are offered and at the construction stage problems related to mounting, painting and surface details still have to be solved. *Designer Logic* is the odd one out in that no construction results from the screen model.

This concept is not new; *Plane Designer* from Griffin & George has been available for years, permitting children to design, print and construct simple flying models which, once tested, can be modified, rebuilt and retested.

Central to the software is something that Data Designs describes as printware. Utilising a central, printer control Rom, disc-based software is developed allowing all manner of subjects to be designed, and construction pieces to be

printed out – including the necessary glue tabs! Archimedes versions, however, do not require a Rom.

Designer Castles for the BBC micro was extensively reviewed in *BAU* March 1989. It is a set of materials for designing castle units and printing them out on the printer. Once assembled these models are surprisingly strong. One extra benefit is that model layouts may be saved to Campus 2000 on the Castles database so that a variety of layouts is always available for downloading. This software follows sound design principles, allowing the user to see the product from plan and elevation view. It is easy to edit and modify in response to new design constraints.

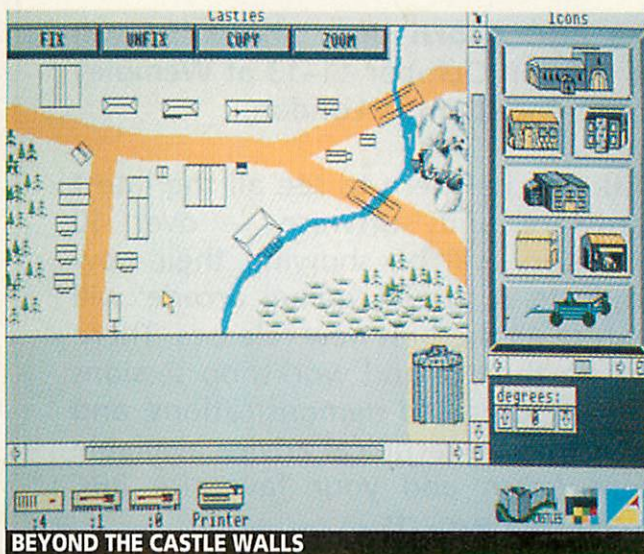
The Archimedes version improves on the BBC B in a number of ways in addition to negating the need for yet another Rom. A full wimp environment operates and the black/white BBC screen layout is replaced by a colourful Mode 12 environment. The layout in windows is both clear and logical.

IN THE MODE

Two modes are used alternately throughout the design process: The first is the icon selection mode where the various design elements such as walls, towers, keep are chosen and combined as required on an 'elevation strip' at the bottom of the screen.

In the placement mode the elements are picked up and fixed in position in plan view on the design screen. Both a gridlock and free placement are offered making alignment quite straightforward. For fine angular movements a degrees window provides accurate rotations in degrees.

At any point a wall unit can be 'unfixed' and rotated or



BEYOND THE CASTLE WALLS

deleted. Three sets of icons are offered at the design stage – the first set represents low and high walls, round and square towers and a square keep. The second set comprises a variety of inner bailey buildings, the third a variety of siege weapons. Unfortunately, the popular windows option on the BBC is not present on the current Arc version so arrow loop-holes and so on must be drawn by the children prior to construction. Square keep castles such as Rochester and curtain wall castles like Beaumaris can both be modelled using *Designer Castles*.

Designs may be saved to disc for further amendments later on. The big bonus for Archimedes owners is that in addition to all the castle icons are the complete set of village icons and drawing tools to enable coloured plans to be designed. So a castle and its neighbouring village can be drawn on the plan and all the component pieces printed out, including the plan.

The current version does not support autoscaling of the model, so only one size of model is possible at present and this cannot be placed



EDITING ON-SCREEN

accurately onto the plan. Similarly, the 'tile' option is also missing and those huge printed plans you may have seen on the Data Design stand at the BETT Show cannot as yet be produced from the Arc version. Data Design tells me this will be implemented together with the windows option on version 1.2.

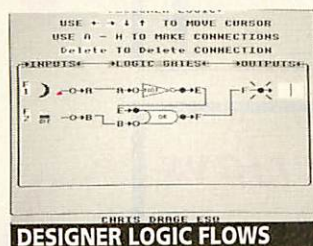
I had the opportunity to test this software with my current Year-3 class whom I had taken on a visit to Rochester to see the castle and cathedral. They reconstructed the castle as it was in 1215 AD with unparal-

LEARNING

Design's popular multi-disciplinary approach to learning by doing



DESIGNER CASTLES: SURPRISINGLY STRONG



leled gusto and enthusiasm. The whole model fits on a 'standard' blackboard. I was amazed at the amount of thought that took place over the proportions of the 'stonework', the relative heights of the walls and which colour to choose to ensure it all '...looked the same'.

Designer Castles prints the keep with square towers. The children were well aware of Rochester's unusual round tower built after King John's 1215 siege and were determined that this should be shown on the model. This produced more problem solving and discussion. Each item was glued to thin card to ensure that the model would have the strength to survive my class's handling of it.

The resulting construction is remarkably strong providing it is glued to a sturdy card or ply base. Measurement, estimation angles and proportion were some of the mathematical

aspects to come out of *Designer Castles*.

The package supports Risc OS compatible printer drivers. I used Computer Concepts' LaserDirect printer and the whole castle/village model was printed out very speedily indeed. Two types of output are possible: The former produces the pieces ready to be cut out and assembled. Currently, these can be only in one size. A plan of the castle/village may be printed as a rough guide to construction. Unfortunately, the 2D elevation view of each wall available on the BBC B version, which permits printing of a small and simplified version of the finished castle, is not possible on the Arc version.

Designer Environment (BBC B/Master) has followed in the wake of *Castles* and is a program which permits children to create a modern environment including a range of structures from phone boxes to mosques. A plan of the district can be drawn on screen and printed out up to 2m square, on which the assembled buildings can be placed. The program follows the operation of *Medieval Villages* very closely, offering all the features of the latter program. *Designer Environment* will

find a niche in many a school software library as it addresses so many areas of the curriculum: geography, history, technology, art and IT.

It is particularly relevant to the national geography curriculum where comparisons between one's own environment and another is an important aspect. Similarly, using both *Medieval Villages* and *Designer Environment* two models could be built based on medieval or tudor times and modern maps illustrating change in a particular area. An Archimedes version of this program, too, is in development.

Another Archimedes program, *Designer Logic*, directly addresses the national mathematics curriculum requirements for pupils to understand logic gates (AND, OR, NAND and so on). The program permits a screen model to be made depicting the flow from an input, such as a temperature sensor, through a logic gate to an output, like a buzzer.

EXPERIMENTAL

From using a basic AND gate to the more complex latch-type circuit, pupils can learn through experimentation at their own pace. Completed designs can be saved and printed out for work away from the computer.

The Arc version is superior to the BBC B version in terms of colour and operation but is not Risc Os compliant. Taking over the whole screen, the program looks and feels like just what it is: an Arc rewrite of a BBC B program. Data Designs assures me that a Risc Os version is on the drawing board which will permit icons to be picked up using the mouse and placed on the design.

Data Design is planning further *Designer* software, the next being *Designer Boxes* for

the Archimedes series. Although only on the drawing board, *Boxes* may prove to be the most innovative member of the *Designer* series to date.

A cuboid shown in isometric oblique view may be stretched and pulled like a !Draw object with the changes being mirrored by windows each one of which contains the three angles of projection: plan, elevation and front views. Measurement tools including protractor, volume, and 'tape measure' are included, permitting accurate stretching of the shape and consistency among planned groups of shapes.

Once the final shape has been decided upon, !Draw objects or !Paint sprites can be mapped onto each or all of the surfaces. Initial plans include a cuboid shape but, with the addition of raw pyramid and cone shapes, just about any other shape can be produced, decorated, and printed out - this program would find wide applications in mathematics, science and technology.

Not only would I thoroughly recommended this software for schools but also as a Christmas gift for home computer buffs. It will keep the kids (and parents) quiet for hours!


PRODUCT DETAILS

For the BBC B, B+, Master 128
 Printware ROM : £24.95
 Designer Castles: £19.95
 Medieval Villages: £19.95
 Designer Environment: £25.00
 Designer Logic: £25.00

For the Archimedes/A3000
 Designer Castles: £60.00
 Medieval Village: £60.00
 Designer Logic : £25.00

For more information contact
 Data Designs, Business and
 Innovation Centre, Innovation
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Triple  Education is a new company established to meet the ever-changing complex needs of YOUR child and the National Curriculum

Behind Triple Education

Pete Davidson (Project Director)

Pete has a BSc(hons) in Mathematics and Computer Science and also has certificate of education. He has been involved in education all his working life and has taught in Primary and Secondary schools and also lectured at University.

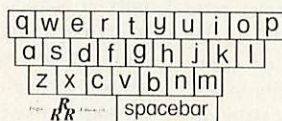
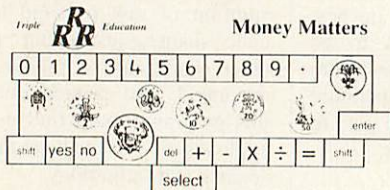
Over the past few years he has been involved in publishing magazines and software. He has been features editor of *The Micro User* and the world's first educational computer comic *Let's Compute!* He's also worked on many top educational software packages such as *Mini Office*, *Mini Office II*, and the award-winning *Fun School* series.

Steve Botterill (Financial Director)

Steve is a well-known figure in the computer software industry. He helped to establish **Superior Software** as the leading games producer for the BBC and Ejectron from 1982 to 1988. More recently he set up **Impact Software** and now is co-director of **The Fourth Dimension** and **Triple R Education**.

Steve intends to bring to educational software the quality of sound and graphics that modern games display but are lacking from other packages. And with all the Fourth Dimension equipment and programmers to help, **Triple R** is going to set brand new standards for educational software.

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Education

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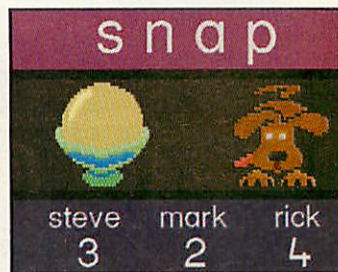
Snap: A bright and entertaining educational version of the popular game with three levels and for up to three players.

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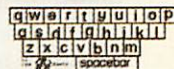
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Picture Book comes complete with two revolutionary lower case keyboard overlays



Money Matters

A superb suite of programs to teach currency facts. Based on a circus theme it's ideal for all children from tots to teens. Youngsters will love the cheerful clown graphics and the unique coin keyboard overlay. This is the best way for children to learn all about British coins and ways of tendering sums of money.

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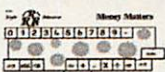
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BBC A3000/Archimedes disc19.95



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Money Matters comes complete with a keyboard overlay. Children can press pictures of coins rather than the computer keys

DataWord

This unique program has been designed with ease of use as a priority and fulfills many of the needs for a database in the National Curriculum. It works just like a card index but the flexibility of the text editor allows you to also use DataWord as a word processor too! Another really powerful feature of Dataword is the built-in card linking system which means parents and teachers can create files of inter-connected cards. THIS IS NOT JUST A DATABASE, it's a word processor, quiz game, electronic programmed learning book and a fabulous introduction to the world of Information Technology.

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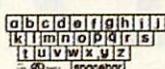
Master Compact 3 1/2" disc15.95
BBC A3000/Archimedes disc19.95



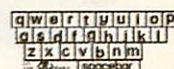
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Data Word comes complete with two of the revolutionary lower case keyboard overlays and FIVE fascinating example files.



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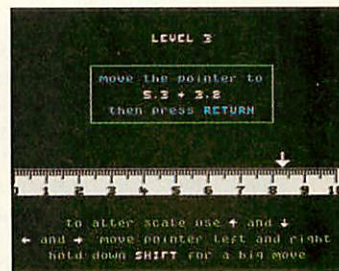
Slider: A computer version of Snakes and Ladders.

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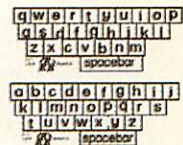
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DAVE FUTCHER takes you on an archaeological adventure and unearths the value of Sherston's Arcventure software

GET DUG IN

Most people are fascinated by prehistoric monuments, Roman villas, castles and churches. Many have become intrigued by the work being done by archaeologists, especially when the newspapers cover the finding of a 13th century gold brooch or the discovery of a skeleton in a Viking burial mound.

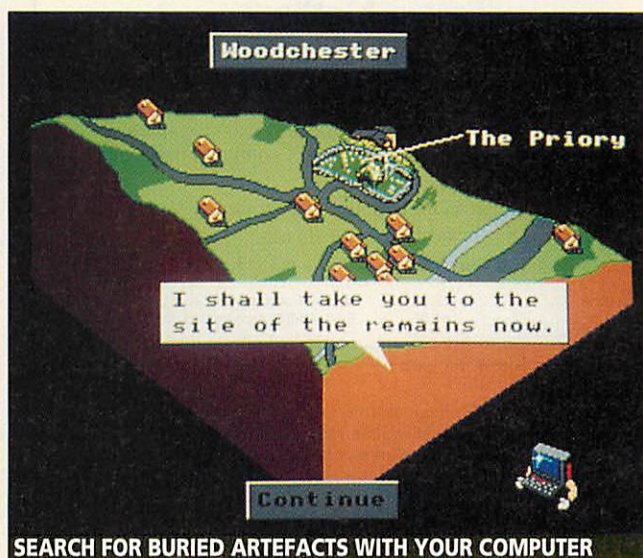
Arcventure offers the possibility of entering that kind of world. It's an archaeological adventure into Roman times. The program was designed and written by Mark Vanstone and has been fully researched by David Warner and developed in conjunction with Steve Hartgroves, an archaeological officer from Cornwall.

There are two distinct parts to the program. First there is the 'excavation' which takes place in recent history and

then there's the 'expedition' which takes place in the second century of Roman times in Britain.

The excavation is based on a real site at Woodchester in Gloucestershire, which was a villa belonging to either a Roman governor or a wealthy native who had been favoured by the Romans. It is modelled on a dig by Samuel Lyons between 1793 and 1796 which uncovered the famous Orpheus mosaic pavement.

Although *Arcventure* does not completely simulate an archaeological excavation, which is a highly complex and technical operation, it does offer a very good structured simulation, allowing anyone with a BBC A3000 or an Archimedes to search for buried artefacts by 'digging' with their computer.



Arcventure is a very simple program to use, and most of the program's options are controlled by a single click on the Select button, although the

occasional use of Adjust is also called for. The keyboard is used for saving the current position and displaying other information.

When *Arcventure* is started for the first time, a very good introduction called the Archaeologist's Instruction option is available. This takes you through some simple steps which show how to use the excavation part of the program. In this introduction you are shown the various functions by a character called Arc 1 who takes on the form of a computer. By following Arc 1's instructions you won't have any problems finding your way around the *Arcventure* environment.

WHERE YOU DIG

After the introduction Arc 1 provides a map of Great Britain on screen and from here you are zoomed to a map of the Gloucestershire area. A click on the continue button zooms you to a three dimensional view of Woodchester village and its Priory. Another click takes you to a two dimensional view of the Priory where the excavation takes place. This on screen map is used throughout the excavation and shows where the walls of the original Roman villa were found.

The on-screen map is placed in the centre of the screen with the control panel and a three bar Choice board for selecting options, four arrows for movement and a set of tools for the excavation below the map and time and score information above.

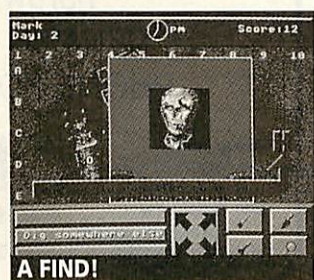
A message window opens and you are told that you have 14 days to find out about life as it was in Roman times. Two options are initially offered. One offers help, but only tells you that there are many interesting objects to be found and that the Choice board is used to select what you want to do. The other option takes you to the information hut which is a very important feature in the whole excavation.

The information hut is the place where objects that have been found are stored. It is also the place where the archaeologists' computer is located and is used to discover more information about individual objects as they are found. Any objects collected during the dig are stored in the Objects Collected section and to get information about one of

them you have to click on its name. When this has been done, the object appears in the centre of the screen and further information appears via a teletype display. For instance if you find a few pieces of leather, the message would be:

This mass of leather seems to be a boot of some kind. It is possible that it was once worn by a Roman soldier.

As well as a colour picture of the object as it was found and the written information about it, *Arcventure* offers a reconstruction facility. By clicking on this option you are provided with a reconstruction of what the object probably looked like. There is also a Cut



Away option which produces a cross section of the part of the site where the object was found and the display also indicates the age of the object in relation to the age of the house.

DIGGING

Once the information hut has been visited you can start digging. You can choose a tool by clicking on one of the icons at the bottom right of the display. Four different tools are provided. A spade for digging quickly and crudely, a trowel for more careful digging, a brush for fine work and a magnifying glass which can be used for inspecting the ground you are working on.

Once you have chosen the tool you want to dig with, you are asked to choose where you want to dig. This is done by moving the pointer to wherever you want to dig on the map and clicking the Select button. A window will open showing a small character digging.

After a short while a message will appear on the screen telling you what your digging has uncovered. If your message is 'You see nothing but bare earth', you need to dig

somewhere else. When you find an object the option bars provide three choices – Store object; Look and store; Leave object.

There is a wide range of artefacts that can be found in the archaeological simulation. These include coins, dice, a bucket, bottle, a pottery jar, a boot, a statue, fragments of a lyre and a key.

There are also six special 'unknown' artefacts which can be investigated in the 'expedition' part of the adventure. The objects have been chosen by the author to give an overall impression of life in Roman Britain, and do not totally reflect the kind or the quantity of finds from an average dig.

TIME TRAVEL

What makes *Arcventure* more than an archaeological simulation, and totally different, is its time travel dimension. Whenever the children encounter one of the 'unknown' artefacts Arc 1 opens up a window and invites them to journey back to Roman Britain via a time line to try and discover just what the artefact was used for.

This journey takes them to the Woodchester villa and parts of the Roman town of Corinium which is present day Cirencester. In the villa they can visit the main house, the bath house and the stables while in the town they enter through Gloucester Gate, and they can visit the Forum, the amphitheatre, the barracks and the Bath Gate.

During the expedition the children can talk to any characters they meet – some tell them about aspects of Roman life while others help them find out what the mystery artefact actually is. Two expedition cards provide information on latin words, and the various characters and objects they come across and need to use during their exploration.

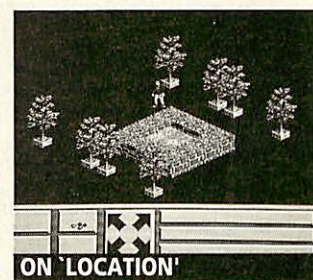
The expedition part of *Arcventure* is the basis for a series of very clever historical adventures. A lot of different places have to be visited and objects moved and manipulated and mysteries have to be solved.

In these adventures, aspects of Roman life become clearer and there is no doubt that this

part of the program will assist in the building up of children's understanding of what life in Roman Britain was like.

CONCLUSIONS

Arcventure is an exciting program that provides two complementary activities. Initially the users can work in the present, joining in a dig and building up a picture of how an archaeologist would work. They can choose where to explore, pick the right tool for each part of the uncovering process, being careful not to damage any of the remains, and then experience the excitement of finding artefacts in the earth and identifying what they



have found. Although obviously simplified, *Arcventure* remains a very good archaeological simulation. Its expedition dimension is the surprise. In it the children can leave twentieth century Britain and find themselves in second century Roman Britain at the entrance of a Roman villa. It's a wonderful way to experience history.

There are obvious uses for *Arcventure* within schools. It will certainly be used as an important part of any work on the Romans. But anyone who wants to experience what a simplified archaeological dig would be like will also find *Arcventure* worth exploring too. Sherston Software has produced an easy to use high-quality software package that brings history alive in a rather unique way by offering an archaeological expedition into Roman times.

PRODUCT DETAILS

Arcventure costs £29.95 from Sherston Software, Swan Barton, Malmesbury, Wiltshire SN16 0LH. Tel: (0666) 840433. It is available for the Archimedes and BBC A3000 computers.

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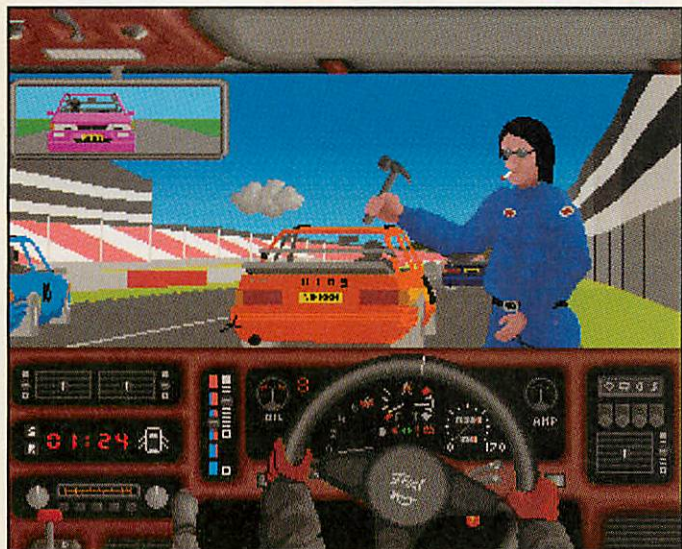
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Graphics

The game features 256 colour, mode 13 graphics, designed by a professional artist. The view is a first person, cockpit view from which you can see the road ahead, the rear view mirror and instruments. The main view features totally customised handwritten ARM code graphics routines which were necessary to maintain the superb frame rate and create a view previously undreamed of. The courses (Silverstone & Brands Hatch) feature bridges, stands, gravel traps, barriers, the pit lane, and even the man with the chequered flag. Of course there are many other features, but we think its better to save most of them to be a surprise!

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Frame Rate	Up to 25 FPS
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Graphics	256 colour, mode 13 graphics Handwritten custom graphics routines
Sound	Digitally sampled sound effects (Naturally!)
Computer	Any Archimedes with 1Mbyte or more
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SLIMLINE SAMPLING

Serial Port's small Econet-based sound sampler gets the once over from
PAUL JAMES

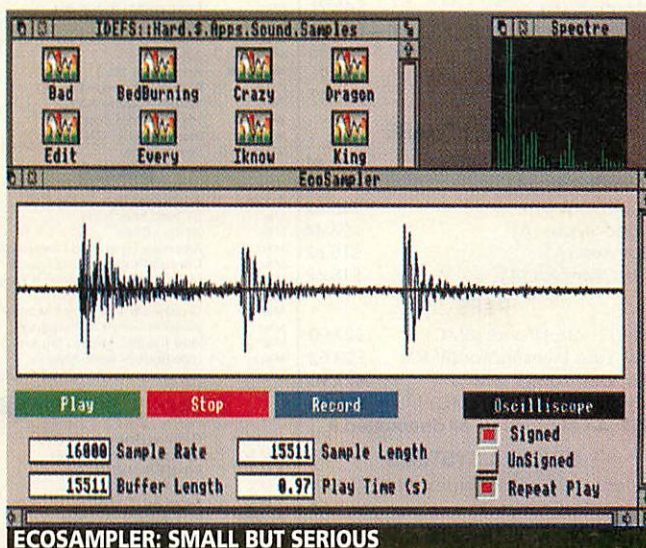
There seems to be a fad recently to plug things into the often unused Econet port on the Arc. High-speed serial links and joystick interfaces seem reasonable, but a sound sampler?

Well, the Serial Port has done it. Ecosampler is not only a sound sampler, but an Acorn standard Midi interface too, all on a board just 5x5cm, and all for around £50.

Sound sampling has a fascinating potential. Given the right software then it doesn't take much to realise how easy people like Vanilla Ice have it. Record a sound, press a few buttons, and as long as you have your Arc connected up to a decent amplifier then you'll sound just as good.

Of course sound sampling has other uses. If you write software then introducing samples into this can make a user feel much more at home. A user will immediately warm to a program that actually asks you to insert a disc, rather than throw up a box with 'Please insert disc 5' in it. Teachers have a definite use for sampling. When a child may not be that good at reading, or partially sighted, then a voice coming from the machine will make it seem far more friendly and encouraging.

The Ecosampler board itself is well-constructed. There are few components on it and it's quite nice to see that corners haven't been cut in production, which would have been easy to do with such an inexpensive product. The Econet port is used as its input and a specially built cable is supplied which has a 3mm input jack and Midi in and out leads, all of which dangle from the back of the board.



The sampler takes input from devices such as personal stereos and hi-fis, and the lead includes a section that will take a stereo input and convert it to mono. A standard 3.5mm stereo jack is supplied at the end that plugs into the source, but you can buy adaptors that fit to this that will convert it to a 5mm jack, which is common on older stereo systems.

My first attempt at recording a sound was completely unsuccessful, and after pulling the board out and putting it back again it decided to work. Later I found the cause was not the connection of the board but a fault in the lead supplied, which caused it to work intermittently. Rather annoying, because the only way to record a sound involves you plugging the jack into the output of the source, which in most cases cuts off all other sound.

Effectively, you record blind. So if your lead does play up then you don't know until you replay your sound through the computer. An oscilloscope option is sup-

plied, though, which displays on screen what the sampler is receiving.

The oscilloscope option is also used to adjust the input level from the source. This can only be done by adjusting the volume of the sound coming into the sampler, so the source needs to have a volume control. Anything above 2.5V will be mercilessly cropped and will turn out as noise.

The sampling itself is done to a maximum of 250,000 samples per second on an 8-bit level, meaning that 127 is silent, with 0 and 255 being full volume. The output of a sampled sound is very good, and apart from some line noise introduced by the Arc (output sounds are filtered to death), well I couldn't tell it apart from my CD, easily. Serial Port is looking into the internal filtering problem and hopes to provide a little clip that will bypass the small piece of circuitry inside the Arc.

What is lacking is the software. I can just about understand why Serial Port has been

so impatient as to release the sampler as a product now, with software that is not acceptable, but it should have been more patient. Receiving half-written software is not only disappointing but probably costs the company more in sending new versions out, therefore adding costs to the final product.

At present recording sounds is a matter of setting up an input buffer, in bytes, and sample rate. The length of the sample is displayed and clicking on the record button blanks the screen and records what's going on. Then, after a short delay your sample is displayed on the screen. Here you can reprocess it in various ways such as filtering and under-sampling. This is a necessity if your sample rate isn't that high, but it does take some time to process the sample.

I was pleased with the product – it's inexpensive and effective. The software is horribly naff at the moment, but it does allow you to record, save and play back sounds. Updated versions should be available soon. Also on the disc is a small program that will patch *Armadeus* so it picks up the sampler as a module, which of course it isn't. For Midi users a Midi echo application is included, and also a small application for future use. The Midi net will allow four computers to be connected together and multi-player games to be played. Watch this space for further developments.

PRODUCT DETAILS

The Ecosampler costs £69 from The Serial Port, Burcott Manor, Wells, Somerset, BA5 1NH Tel: (0243) 531194.

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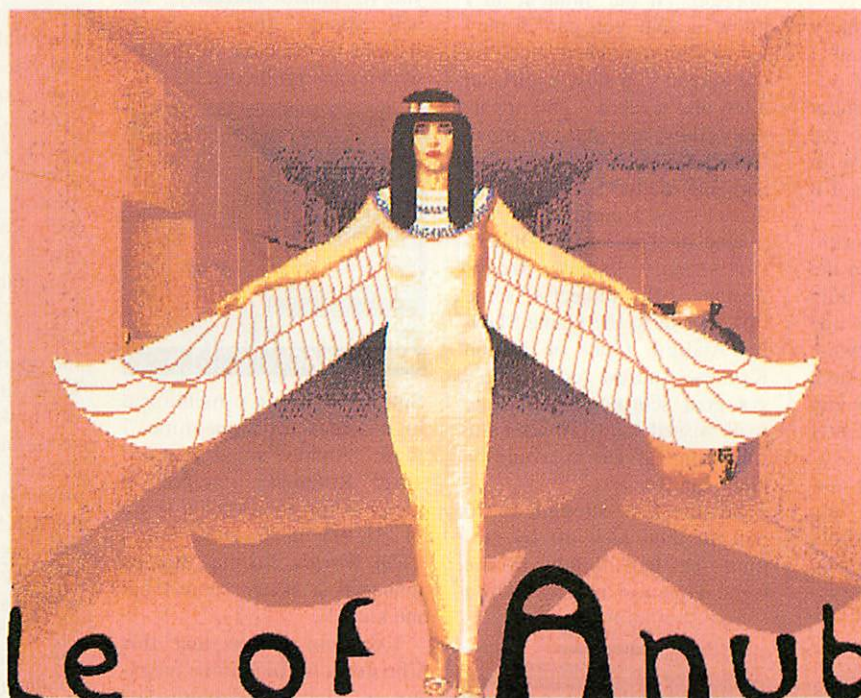
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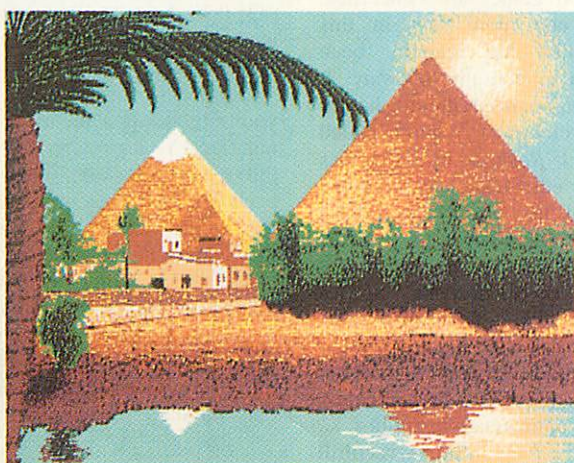
Coming to an

 *rchimedes*

near you soon !



Tale of Anubus





GAME SHOW

Air Supremacy is a new 32-bit game from Superior Software, and, broadly speaking, is a straight cross between *Zarch* and *Conqueror*. This is because you travel around a 3D landscape shooting at things (of course) and deciding when to change between your tank and your plane.

I've been playing an early version of *Supremacy* and I can tell you that it's very difficult to both fly and shoot things on the ground at the same time! I think I need a bit more practice. Meanwhile, I'll stick to the tank.

On the subject of Superior, you may remember that in the *Speech!* review in the July issue, we moaned about the problem of using the software with a SCSI disc system instead of ADFS, especially since SCSI has recently become quite popular.

Well, apparently, all the new copies of *Speech!* being sent out will now work on both ADFS and SCSI, so this event hereby goes down in history –

a software publisher has listened to a reviewer!

Speaking of software that makes your computer talk, The Fourth Dimension recently released its speech package, *ARCtulate*. I'm looking forward to finding the differences between it and Superior *Speech!*. At the moment all I know is that you can display up to four animated faces on the screen – a boy, a girl, an alien and a robot – and apparently they are able to move their mouths in a convincing way no matter what you ask them to say! Hmmm!

One of The Fourth Dimension's early games, *Arcade Soccer*, is the subject of some tips sent in to the Game Show by Andrew Gray of Milton Keynes. Andrew reckons he's got goal scoring in the game well sussed, and provides the following advice to would-be Gary Linekers.

Set the kick strength to 70 percent then kick off by tapping the ball lightly to the right. Then run as close as you

dare up the right-hand side of the pitch until just before you are level with the semi-circular marking near the goal. At this point, divert onto a diagonal path and head straight for the furthest corner of the net.

As soon as you move into the penalty area, shoot and, if you've aimed correctly, the ball should find its way straight to the back of the net without any problems.



Since we haven't mentioned high scores for some time, I think Andrew's 11-year-old sister Rosemary deserves a mention for achieving a score of 71,195 in Cygnus Soft's *Twin Worlds*. So, has anyone managed a better score? Let me know!

I've said before that this Christmas is going to be mega-hot as far as Archimedes/A3000 games are concerned, and one more step in this direction has recently been taken by Krisalis Software. It has announced the forthcoming release of a game called *Chuck Rock*, a title that has been enjoying success at the top of the 16-bit charts. I don't really know how to describe *Chuck Rock*, except to say that in it, you chuck rocks!

I'd like to finish this month's Game Show by wishing the computer holiday camp, Computer Park, a happy tenth anniversary in August.

Sam Greenhill

PLAY IT AGAIN SAM 15

Superior Software. Tel: (0652) 58585. BBC/Electron cass £12.95; BBC disc £14.95; Compact £19.95

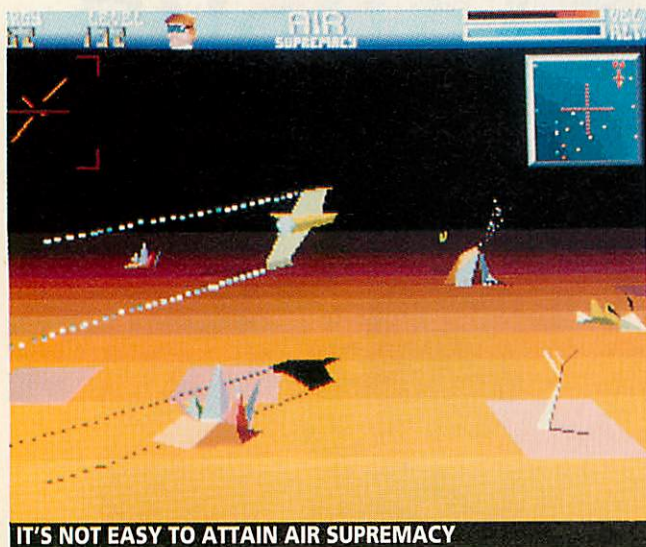
The latest Beeb compilation from Superior contains two recent blasts from the past, one old chestnut, and an excellent new title, called *Cyborg Warriors*.

The Last Ninja 2 boasts an enormous playing area set over several parts of downtown New York, and the war against drugs is the ninja's mission. This game was coded by Peter Scott, who wrote the rather elderly *Network* which is also included. This is an amusing levels and platforms affair, full of cuddly aliens, and has remarkably fine gameplay for a game of early-80s, fledgling Scott, vintage.

Also here is the simply massive *Ricochet*. The neat twist to this game is that your spherical character called Sprat has to first squash himself down to gain enough 'bounce' to leap up onto higher platforms. This is easier said than done, and is frustrating but fun.

The new game, *Cyborg Warriors*, is a real treat for all you trigger-happy shoot'em up fanatics. You just fly along through the sideways-scrolling backdrop knocking merry hell out of everyone and everything that stands in your way.

The background has five planes of silky-smooth parallax, and it gives you a real feeling of depth as you progress through the eight different thematic levels, which

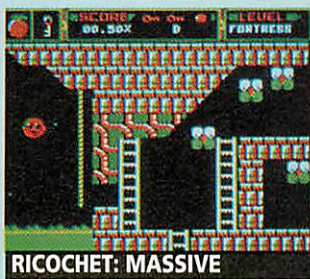


IT'S NOT EASY TO ATTAIN AIR SUPREMACY

range widely from forest and desert scenes to a future city and a volcanic landscape.

The game also incorporates, without a hint of flicker, large, multi-segmented, lobster-like adversaries while sustaining the background movement. Tokens can be collected to beweapon yourself beyond a standard laser, and if you have a joystick you can play with a friend. Overall, this is one of the best *Sams* so far.

Mat Tizard



BOOGIE BUGGY

Fourth Dimension. Tel: (0742) 700661. Archimedes/A3000 £24.95

Ahhhhhhhhh! I can't stand it anymore! This has got to be the most irritating game I've ever played. All my muscles are strained through trying to make this stupid smiling bouncing red dodgem car bounce in the right direction and it's killing me!



NOT TOO FRIENDLY...

Sorry about that outburst; welcome to *Boogie Buggy*! Boogie's aim is to thwart evil and champion good, by collecting evil-ore and dropping it down manhole covers in Dodge City. Or at least that's what he does in the four city regions, which are quite good

NO EXCUSES

Arxe Systems, tel: 081-534 1198. Archimedes/A3000 £24.95

No Excuses is best described as a tactical space-invaders. The aim of the game is to rid an isometric eight by eight grid of little green nasties that hover overhead. You play the part of the Strider; a kind of two-legged blue spider that can travel around the grid, square by square.

Aliens can be destroyed by either shooting them when they are directly overhead or waiting until they've landed and then zapping them. You'll have to be quick, as the unfriendly visitors also drop bombs as they descend and fire missiles when they land.

As well as providing you with an early grave, the alien's bombs produce a number of

effects when they hit the grid. Each square can be any one of 16 types. Glue bombs make squares sticky, and the Strider takes longer to cross them. Smart bombs create squares



ALL ALIENS MUST DIE!

that destroy all aliens that have already landed. One particularly useful effect is the Super square that provides the Strider with his or her own super-person outfit.

When all aliens have been destroyed, a key can be collected and the Strider can move to the next level. Fifty

levels are provided as standard and for those who manage to complete these, (or for those who can't!) a level designer is included that allows you to create your own puzzles.

The designer is really easy to operate with the mouse being used to pick squares and position them on the new grid.

Graphics in the game are a simple 16-colour affair, being a direct port from the Atari ST version. The sound is similarly basic, consisting of a few, rather distorted, samples that play between levels.

No Excuses is reasonable fun because it's different to virtually anything else on the market. Once you've finished the 50 levels though, there doesn't seem much to hold your interest. The level designer helps, Rather a disappointing 'sequel' to *Rotor*.

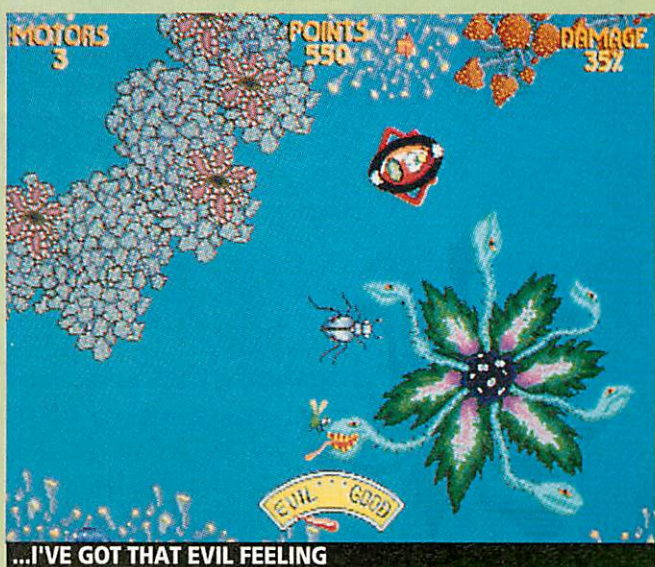
Rob Miller

fun. The Ore Conversion Plants are used by some evil monster chappie to create the evil-ore, and there are four increasingly irritating OCPs to be destroyed.

The first thing you notice about Boogie is that the graphics are gorgeous. The game uses the border as well as the main screen which in fact increases the main playing area by about 40 percent and the effect is stunning. The characters are all nicely drawn and animated, and in the city regions Boogie can whizz about collecting ore, leap over the scores of creepy-crawlies and collect bonuses in a very traditional, and welcome, arcade style manner.

He can even pick up some weird extension to his 'nose' which looks like a chain saw, and slice up the creepies. Contact with creepies affects the damage meter, and at 100 percent Boogie dies, though collected plasters can patch up most of the holes.

In the OCPs the view changes from overhead to side, and Boogie has to jump from



...I'VE GOT THAT EVIL FEELING

room to room until he finds the polarity switch, then throw it and get out before the whole thing explodes.

Here's the irritating part. To move between rooms, Boogie must jump. Whenever Boogie jumps, he hits something and causes damage to himself. At 100 percent Boogie dies. Therefore Boogie dies a lot, making the whole game nigh on

impossible, since all nine regions must be completed in one game, and there's no password or save game facilities.

Boogie Buggy is fun until you get into it and realise that you're likely to get very annoyed and give up long before you ever complete it. Or at least that's my experience. In summation, 'irritating'.

Sam Greenhill

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One Line Game - Ekans revisited!

There is good news from planet Ekans. Since our last visit, in July of this year, new research has revealed that there are five distinct types of radioactive particles. If two particles of the same type are brought into close proximity (within a strongly positive ion field) they are harmlessly neutralised. To this end, a small ion chamber has been built into the cybernetic snake. Aligning the particles is a very tricky operation and requires quick thinking and a steady hand. Particles enter the ion field from above and slowly fill the chamber. Keys '1' and '3' activate local cyclo-magnetic generators and will move the particle left and right as it falls. Once stored in the ion field, adjacent particles of similar types will be neutralised, disappearing from the chamber and thus making room for further particles. Unfortunately no one knows what happens if the chamber fills up completely!

Entering the program

We couldn't quite make the program small enough to type in on one line, so we've come up with a rather cunning alternative! Carefully type in listing 1 and run it. Now type in the actual game in Listing 2 (There are seven spaces in line 50). Now press F0. This will convert the game from a multi-line Basic program into a function key definition. Type NEW then press 1 followed by F0, and as if by magic, this will create a true one line program which can be saved in the usual way. Please keep a copy of listing 1 as you'll probably need it for future games...

```
10*KEY 0
DIM mem 300:
$mem="*KEY0":
t=mem+5:
f=PAGE:
REPEAT:
l=f?3-4:
f=f+4:
FOR i=1 TO l:
b=?f:
?b:
t=t+1:
f=f+1:
NEXT:
?t=ASC*":
t=t-(b<>F5):
UNTIL f=TOP-2:
$(t-1)="IIM":
X%=mem MOD 256:
Y%=mem DIV 256:
CALL &FFF71M
```

Listing 1

```
10 MODE7
20 e=32
30 s=5^5
40 VDU23;1,9
50 PRINTSTRINGS(114,
"+")CHR$30STRINGS(11,
CHR$9+" "+CHR$9)
60 REPEAT
70 x=HIMEM+RND(7)
80 n=RND(5)+48
90 REPEAT
100 k=VALINKEY$15
110 d=SGN(k-2)*SGNK+9
120 ?x=e
130 x=x-d*(x?d=e)
140 ?x=n
150 UNTIL x?9>e
160 i=0
170 REPEAT
180 m=HIMEM+96-i
190 a=?m<48
200 b=a OR m?9>e
210 c=a OR ?m<>m?1
220 m?(9+b*s)=?m
230 m?(1+c*s)=e
240 m?(-b*c*s)=e
250 i=b*c*(i+1)
260 UNTIL i=96
270 UNTIL 0
```

Listing 2

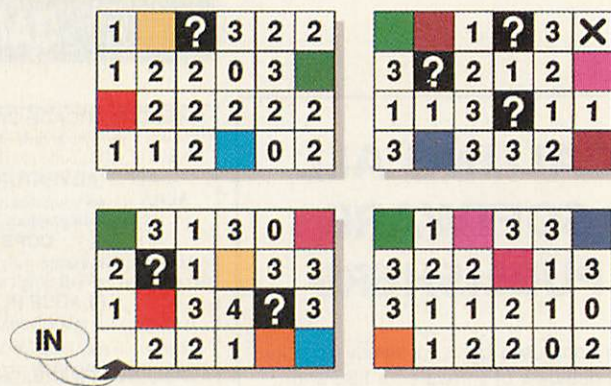
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PRIZE

Prize Puzzle



This diagram is from infamous secret agent Miss S P O'Nardge's notebook. It shows details of the interior of a secret foreign installation - obtained during previous intelligence missions. O'Nardge's task is to recover documents held in a safe in the room marked X. However, the four-storey building is heavily protected by sophisticated alarm and monitoring devices.

Equipped with the latest gadgetry O'Nardge is ready to begin her mission. In each room she has noted down the number of minutes she expects to take to disable any alarms therein. The question marks show rooms which have hitherto been impenetrable and which she must avoid. Other rooms, shown in colour, contain known secret passages through which she can safely pass. These make up her route from floor to floor and may also save her time. To help further, the organisation employing O'Nardge has a high-speed computer, which has been programmed to find her fastest route through the building to the safe and out again.

She must enter the room marked 'IN' and thereafter may move to any horizontally or vertically adjacent room. Having entered a room containing a secret passage, she must pass through that passage (to the room of the same colour) and from there to any adjacent room in the usual way. Except for 'IN' she cannot enter any room twice.

O'Nardge has found a route that will only involve 30 minutes of alarm-disabling. Did the computer calculate a quicker one? If so, how long did O'Nardge spend disabling alarms and how many rooms, counting 'IN' only once, did she enter? Send your solution (time and number of rooms) to 'September competition' at the usual address. The winner will be the sender of the first correct solution out of our hat on 31 August 1991.

July Prize Jigword solution

Congratulations to Mr Nigel Parker of Devon, who wins £25 for correctly solving July's abbreviations jigword. The solution is shown on the right, and the anagram we were looking for was LASER PRINTER.



Anagram Corner

John Maxwell of Harrow earns himself a crisp fiver for the following anagrams. Can you work them out? (Hint: regular readers of the magazine will have a distinct advantage!)

- Acorn field-test crow
- Giant mob punch dad
- A wet roof surprise
- Top rate relish
- Hot cacti men
- Cement cup rots cop
- Nastier waveform
- Hedonist uniform
- Lid emitted miaow
- Rotund fly confectioner



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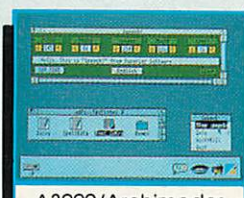
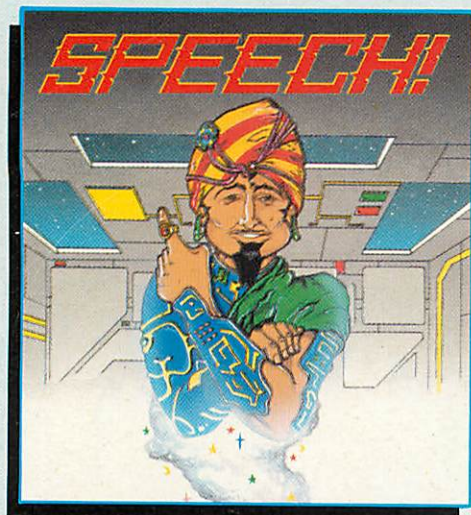


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The new A3000/Archimedes version of SPEECH! is fully RISC OS compatible and allows multitasking in Desktop. You can vary the pitch, speed, volume, and voice, both directly and in your own text files and programs, and can even 'sing' words over a four octave range! The A3000/Archimedes version also includes a program so you can alter the dictionary yourself.

BBC Micro/Master & A3000/Archimedes

MASTER BREAK

Snooker-Style Trivia Quiz Game for 1 to 4 Players

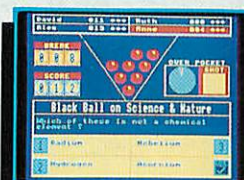
Six categories of questions: SCIENCE & NATURE, POP MUSIC, GEOGRAPHY, SPORTS & PASTIMES, ARTS & HISTORY. Over 1500 questions in the BBC Micro/Electron version. Over 2000 questions in the A3000/Archimedes version, including digitised picture and digitised sound questions.

In the 1 player game, try to get the highest break - you might even manage the maximum break of 147. In the 2 to 4 player game, compete against your friends and family for the highest score and highest break.

Start your frame with an easy red question, then choose your colour - have you the nerve to choose the black ball question? You've used all your PASSES and the ball is OVER THE POCKET - if you miss, it's a FOUL SHOT!

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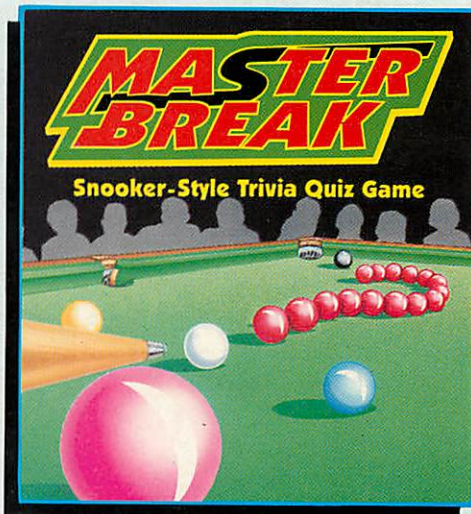
BBC Micro/Master, Electron & A3000/Archimedes



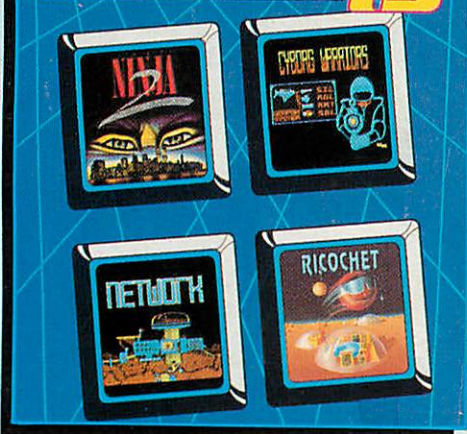
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PLAY IT AGAIN SAM 15



Last Ninja 2



Cyborg Warriors

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CYBORG WARRIORS

A brand-new release by Superior. A multi-level, sideways scrolling shoot-em-up, with lots of weird robots and monsters to shoot, and tokens to collect which can give more powerful weapon systems. The BBC Micro/Master version has a joystick option, which allows two players to battle together.

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An action-packed 'Top Ten' game by Peter Scott, featuring teleport machines, lifts, springs, strange aliens and lots, lots more. Shoot your way through more than 100 different screens as you attempt to collect the twenty parts of the 'Flynche' machine. Nerve-tingling excitement.

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A massive arcade adventure with brilliant graphics, as you control SPRAT, the Small Partially Robotic Alien Time-traveller. Five different levels: FORTRESS, TECHLEV, DERELICT, THE UFO and ANCIENT.

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We have in stock over 30 different titles for the BBC Micro/Master and Acorn Electron computers including such great games as: ELITE, REVS + REVS 4 TRACKS, EXILE, HOSTAGES, A QUESTION OF SPORT, REPTON INFINITY, PERPLEXITY and SIM CITY, and the compilation titles: ACORNSOFT HITS 1 & 2, SUPERIOR COLLECTIONS 1, 2 & 3 and PLAY IT AGAIN SAMs 1 to 14. All are available for immediate despatch

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